

Program Booklet

8th International Conference Aging & Cognition May 7 – $10^{\text{th}} 2025$

Pavia, Italy

European Cognitive Aging Society



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Conference information

CONFERENCE VENUE

The 8th International Aging & Cognition conference of the European Cognitive Aging Society will take place in Pavia, Italy, from May 7th to 10th, 2025 at:

Palazzo Centrale University of Pavia Strada Nuova 65 27100 Pavia, Italy



The conference sessions will be held across several lecture halls:

- Aula Magna and Aula Scarpa located on the ground floor
- Aula Volta located on the first floor.

Each day will start in Aula Magna with keynote lectures, followed by parallel sessions including oral talks and symposia, which will take place in the various aula, while poster sessions will be held in the Cortile delle Magnolie.

Coffee, drinks and snacks will also be served in the Cortile delle Magnolie during coffee breaks and poster sessions.

All lecture halls and key locations will be clearly marked with signage to guide participants throughout the venue.



INTERNET ACCESS

The University offers access to the **eduroam** network for those already connected to it. Additionally, **individual Wi-Fi hotspots will be provided to participants who don't have access to eduroam at registration**, ensuring reliable internet access for everyone throughout the conference.

SOCIAL MEDIA

You can follow us on bluesky: @eucas2025.bsky.social, and X (previously twitter): @EUCAS2025 Don't hesitate to tag us during the conference! Use the hashtag: #EUCAS2025

PRESENTATION GUIDELINES

To avoid delays and ensure a smooth flow between talks, please bring your presentation on a USB drive and visit the designated room to upload it before your session. Each room is equipped with a computer that supports PowerPoint and Adobe reader, and members of the local organizing committee will be available to assist you.

We kindly ask that you upload your presentation according to the following schedule:

- For morning sessions:
- On May 8th, please upload your presentation no later than 15 minutes before the conference opening.
- On May 9th and 10th, please upload it no later than 15 minutes before the keynote talks.
- For afternoon sessions (May 8th and 9th):
- Please upload your presentation no later than 15 minutes before the keynote talks on the respective day.

If you plan to use your own device or have specific technical requirements, make sure to bring any necessary adapters. It is important to check in advance that your device connects properly and that your presentation runs as expected.

Oral talks

Oral talks sessions will be composed of 4 independent presentations. Each presentation will last 15 minutes, followed by 5 minutes of questions. For each oral talk session, a chair will be assigned who will keep track of time, notify presenters of their remaining time, and moderate the Q&A session together with the speakers. The chair must strictly adhere to the session schedule to ensure attendees can move between sessions seamlessly.

Symposia

Symposia will be composed of 4 talks, the chair briefly presents the theme of the symposium, organizes and directs the session, introduces the presenters, and ensures that time limits are strictly observed. Presenters speak for 15 minutes and answer questions for a maximum of 5 minutes. Symposium chairs must strictly adhere to their session's schedule to ensure attendees can move between sessions seamlessly.

Posters

The poster size is A0 portrait format: height 118,9 cm (46,8 inches), width 84,1 cm (33.1 inches).

The ID assigned to your poster in the abstract booklet will correspond to the one on your poster board. Materials for hanging posters will be provided and available on-site.

For Session 1 (Thursday), you may set up your poster during registration.

For Session 2 (Friday), you may set up your poster before the first keynote lecture. Please ensure it is removed by the end of the day, as the space will be needed for the next session.

Printing in Pavia

If you wish to print your poster in Pavia, you can do so at Copy Art, Piazza del Lino, 12 by sending an email at the following address: copyart2014@gmail.com. Please send your poster via email by the **6th of May** to ensure it will be ready by the 7th or on the morning of the 8th. The prices for A0-sized prints on cardstock (160gr) range from 15€ to 18€, depending on the amount of color used.

Social events

WELCOME RECEPTION

The conference will kick off with a Welcome Reception on Wednesday, May 7th, beginning at 18:30. Join us in the beautiful Cortile delle Magnolie for an evening of refreshments, drinks, and light bites, offering a chance to mingle and connect with fellow attendees in a relaxed setting.



JUNIOR SOCIAL EVENT

PhD students and postdoctoral fellows from the local organizing committee are hosting a social event for junior attendees of the conference on the 8th of May at 18:30, meeting point: Torri di Pavia on Piazza Leonardo Da Vinci. This will be a great opportunity to connect with peers in a fun and informal setting, featuring a city tour, games, and drinks.





SOCIAL DINNER



Join us for a delightful Social Dinner on Friday, May 9th, at 19:30 at Collegio Fratelli Cairoli on Piazza Collegio Cairoli 1. Collegio Cairoli is one of the 11 collegios in Pavia and an important part of the city's rich university tradition. Dating back to the 18th century, it belongs to a network of historic colleges that have supported generations of students and scholars.

Enjoy an evening of fine cuisine, good conversation, and a relaxed atmosphere in this unique setting. The dinner is open to participants who have pre-registered — a wonderful chance to unwind and connect with colleagues after the day's sessions.

Program overview

	Wednesday, MAY 7 th 2025
16.00-18.00	Pre-event: Submit a grant Aula Volta
17.00-18.30	Registration Aula Magna
18.30-19.30	Welcome reception (food & drinks) Cortile Magnolie
	Thursday, MAY 8 th 2025
8.30-9.45	Registration Aula Magna
0.45.10.00	Conference Opening

9.45-10.00	Aula Magna
	Keynote speaker 1: Prof. Dr. Paolo Ghisletta
10.00-10.45	Introduced by Ludmila Zajac-Lamparska
	Aula Magna
10.45-11.15	Coffee break
10110 11110	Cortile Magnolie

11.15-12.45	New methodologiesSocial cogniti interactioChair: Paola PrevitaliInteractioAula VoltaAula Scar		si Symposium: <u>Cognitive</u> <u>control</u> Chair: Ralf Krampe <u>Aula Magna</u>
12.45-14.15	Lunch break		
14.15-15.00	Keynote speaker 2: <u>Prof. Dr. Natalie Ebner</u> Introduced by Serena Lecce <i>Aula Magna</i>		
15.00-16.30	Symposium: <u>Social c</u> Chairs: Louise Phillips & <i>Aula Magna</i>	ognition <u>E</u> x Min Yong (Executive functions Chair: Fulvia Castelli Aula Scarpa
16.30-18.00	Poster session 1 & drinks Cortile Magnolie		
18.30-19.30	EUCAS Member Assembly Aula Magna		Junior Social event Meeting point: Torri di Pavia

		Friday, MAY	9 th 2025	
9.00-9.45	Keynote speaker 3: <u>Prof. Dr. Michael Wagner</u> Introduced by Gerardo Salvato <i>Aula Magna</i>			
9.45-11.15	<u>Cognitive training</u> Chair: Sara Bottiroli <i>Aula Volta</i>	Individual difference cognition Chair: Alessia Aula Scarp	ences in Rosi Pa	Symposium: <u>Pragmatics</u> Chair: Valentina Bambini <i>Aula Magna</i>
11.15-12.45	Poster session 2 & Coffee Break Cortile Magnolie			
12.45-14.15	Lunch break			
14.15-15.00	Keynote speaker 4: <u>Prof. Dr. Fabienne Collette</u> Introduced by Pilar Andres <i>Aula Magna</i>			
15.00-16.30	Symposium: <u>Subjective Views of</u> <u>Aging</u> Chair: Enrico Sella <i>Aula Magna</i>		<u>Indivi</u>	<u>dual differences in neural</u> <u>mechanisms</u> Chair: Irene Ceccato <i>Aula Scarpa</i>
17.00-18.00	Poster awards & drinks Cortile Magnolie			

19.30	Social Dinner Collegio Fratelli Cairoli			
		Saturday, MA	Y 10 th 20	025
	Ke	ynote speaker 5:	Prof. Dr.	<u>Alan Gow</u>
9.00-9.45		Introduced by	Louise Ph	illips
		Aula N	Magna	
9.45-10.15	Coffee break Cortile Magnolie			
10.15-11.45	<u>Memory</u> Chair: Anne-Lise Florkin <i>Aula Volta</i>	<u>Training interv</u> <u>& meta-cogr</u> Chair: Federico <i>Aula Scar</i>	v <u>entions</u> nition o Curzel pa	Symposium: <u>Decision</u> <u>making</u> Chairs: Paola Iannello & Laura Colautti <i>Aula Magna</i>
11.45-13.15	Symposium: <u>A complex systems</u> <u>perspective on aging</u> Chair: Richard Ridderinkhof <i>Aula Magna</i>		<u>Cogni</u> C	tive & perceptual changes hair: Federica Salmaso Aula Volta
13.15-13.30	Conclusion Aula Magna			

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Wednesday, May 7th

PRE-EVENT - OVERVIEW

16.00-18.00 Submit a grant: from funding opportunities to writing a project.

Aula Volta

16.00-16.30	Davide Crepaldi	Making Your Ideas Fundable: Discovering Funding Opportunities.
16.30-16.45	Francesca Lionetti	Marie Curie Fellowships: A Gateway to Research Mobility and Growth.
16.45-17.00	Luca Rinaldi	Pathways to an ERC Starting Grant: From Vision to Funding.
17.00-18.00	Gerardo Salvato	From an idea to a Project: Practical Tips for Grant Writing.

PRE-EVENT – ABSTRACTS

Making Your Ideas Fundable: Discovering Funding Opportunities.

By Davide Crepaldi

Affiliation: Department of Brain and Behavioral Sciences, University of Pavia

Navigating the landscape of research funding can be challenging, yet securing the right grant is essential for advancing innovative ideas and building impactful careers.

In this talk, Dr. Davide Crepaldi will explore how to identify relevant funding schemes and align them with your research goals. He will offer insights into the proposal evaluation process from a reviewer's perspective, highlighting what makes an application stand out. Participants will gain practical tips on eligibility, strategic positioning, and available resources to support proposal development.

Whether you are just starting out or well into your academic journey, this session will provide the tools and strategies you need to successfully pursue and secure research funding.

Marie Curie Fellowships: A Gateway to Research Mobility and Growth.

By Francesca Lionetti

Affiliation: Department of Brain and Behavioral Sciences, University of Pavia

In this talk, Dr. Francesca Lionetti introduces the Marie Skłodowska-Curie Postdoctoral Fellowships (MSCA), a prestigious EU program supporting postdocs through mobility, interdisciplinary training, and career development.

You will get a clear, practical overview of what this fellowship offers. More than just a how-to, Dr. Lionetti will draw from her personal MSCA experience with the EStoParenting project. She will share honest insights, practical advice, and personal reflections on how the fellowship shaped her research, collaborations, and personal growth.

Pathways to an ERC Starting Grant: From Vision to Funding.

By Luca Rinaldi

Affiliation: Department of Brain and Behavioral Sciences, University of Pavia

In this talk, Dr. Luca Rinaldi will share his journey leading to a renowned ERC starting grant for the OutOfSpace project. You'll get a behind-the-scenes look at the application process, from the structure of the proposal (Parts B1 and B2) to the interview stage.

With valuable insights and practical strategies, Dr. Rinaldi will break down how to make your project stand out, even early in your career. You'll hear how he chose to communicate his ideas clearly and convincingly, through examples from his own project and ERC interview.

From an idea to a Project: Practical Tips for Grant Writing.

By Gerardo Salvato

Affiliation: Department of Brain and Behavioral Sciences, University of Pavia; Cognitive Neuropsychology Centre, ASST "Grande Ospedale Metropolitano" Niguarda, Milano

In the last talk of this workshop, we will turn ideas into action with a focused introduction to the art of grant writing. Dr. Gerardo Salvato will guide participants through the essential elements to write a successful grant proposal.

He will reiterate why grants are more than just funding, they are powerful tools to build your scientific profile, grow collaborations, and bring ambitious projects to life. With practical tips on writing style, project design, and how to appeal to reviewers, this session will equip you with the mindset and strategies to start planning your grant journey now.

Whether you are preparing your first application or simply curious about the process, this workshop will leave you with actionable takeaways and a clearer path forward.

Thursday, May 8th

KEYNOTE SPEAKERS – OVERVIEW

Aula Magna

Paolo Ghisletta

Challenges and opportunities of psychological aging research

Affiliation: University of Geneva, Switzerland

The scientific study of psychological aging is very challenging due to the complex, multidimensional, multi-directional, and highly variable nature of systematic change in adulthood and old age. Psychological aging encompasses phenomena that require interdisciplinary efforts to be understood. Recent advancements in technology (e.g., wearable devices, apps offering digital metrics, multimodal data collection, artificial intelligence, and big data algorithms) reconfigure the epistemology of social sciences but can, if properly applied and analyzed, enhance our understanding of the mechanisms behind age-related within-person change. As researchers in the field of psychological aging, we must continually train in various domains and keep abreast of new methodologies, with the aim of advancing theoretical perspectives on aging. Collaborative, open, and cumulative research efforts are key to developing our knowledge of psychological aging. Additionally, as privileged observers of aging mechanisms and processes, we bear the responsibility to challenge stereotypes surrounding aging and help educate professionals in related fields who work with older populations. There is also a critical need for accurate scientific information about psychological aging to inform public and social policies, making our contributions even more valuable. This talk will explore some of these challenges of psychological aging research and the opportunities they present.

Natalie Ebner

New directions for studying the aging social-cognitive brain

Affiliation: Center for Cognitive Aging and Memory, McKnight Brain Institute University of Florida

The study of social cognition has extended across the lifespan with a recent special focus on the impacts of aging on the social-cognitive brain. This talk summarizes current knowledge on social perception, theory of mind, empathy, and social behavior from a social-cognitive neuroscience of aging perspective and identifies new directions for studying the aging social- cognitive brain. These new directions highlight the need for (i) standardized operationalization and analysis of social-cognitive constructs; (ii) use of naturalistic paradigms enhance ecological validity social-cognitive to of measures; (iii) application of repeated assessments via single-N designs for robust delineation of social-cognitive processes in the aging brain; and (iv) increased representation of vulnerable aging populations in social-cognitive brain research to enhance diversity, promote generalizability, and allow for cross-population comparisons.

ORAL TALKS – OVERVIEW

11.15-12.45 – New methodologies

Aula Volta

CHAIR OF THE SESSION – Paola Previtali

11.15-11.35	Benjamin Stodt	Detection of changes in sound locations in real and virtual environments: Does age affect perception and neural processing?
11.35-11.55	Burcu Demiray	Older adults' learning interests, needs and challenges with AI tools.
11.55-12.15	Sonja Pedell	Stimulating and fun use of generative AI tools by older adults in a retirement village for producing digital stories.
12.15-12.35	Mario Bonato	<u>Auto-Global Examination of Mental State</u> (Auto-Gems): a web-based cognitive screening.

11.15-12.45 – Social cognitions and interactions

Aula Scarpa

CHAIR OF THE SESSION – Martina Cangelosi

11.15-11.35	Madeleine Long	Switching and social network size predict perspective-taking skills over the adult lifespan: Implications for future interventions.
11.35-11.55	Anne-Lise Florkin	Spontaneous perspective-taking: age- and cultural-related differences.
11.55-12.15	Yvonne Brehmer	Grandchild caregiving and grandparents' cognition: effects of care status, care frequency, and care activities.
12.15-12.35	Laurie Borel	The effect of changes in social participation during the transition to retirement on changes in cognitive functioning: Results from the Canadian longitudinal study on Aging (CLSA).

15.00-16.30 - Executive functions

Aula Scarpa

CHAIR OF THE SESSION - Fulvia Castelli

15.00-15.20	Edmund Wascher	Beyond linear decline: Age-related trajectories of cognitive functions based on EEG data from the Dortmund Vital Study.
15.20-15.40	Febe Demeyer	The impact of cognitive load on insight and analytical problem solving in older adults.
15.40-16.00	Geraldine Rodriguez-Nieto	Age-related differences in cognitive flexibility as a process and as a trait and their intersection at the brain.
16.00-16.20	Sophie Meissner	Gaze behavior during walking in the real world with and without a search task in younger and older adults.

ORAL TALKS – ABSTRACTS

New methodologies

Detection of changes in sound locations in real and virtual environments: Does age affect perception and neural processing?

by Benjamin Stodt¹ | Daniel Neudek² | Rainer Martin² | Stephan Getzmann¹

¹ Leibniz Research Centre for Working Environment and Human Factor (IfADo), Dortmund, Germany ² Institute of Communication Acoustics, Ruhr- Universität Bochum, Bochum, Germany

With an aging workforce, understanding how aging influences routine sensory-cognitive processes, like audio-visual perception in everyday situations, is becoming increasingly important. Virtual reality (VR) facilitates research in ecologically valid contexts. However, it is essential to ensure that findings obtained in VR align with those observed in real-world environments. 22 younger (M=24.00 years) and 22 older participants (M=64.77 years) performed an auditory change detection task in two environments: a real laboratory room with physical loudspeakers and a virtual twin of this room (presented via head-mounted display and headphones). Participants had to respond whenever the sound position shifted to a target loudspeaker positioned in front, behind, to the left, or to the right relative to a central (standard) loudspeaker. During this, behavioral and neurophysiological data (EEG) were collected.

In general, comparable results were observed in both environments, validating VR as a suitable tool for auditory tasks in more life-like scenarios. In both settings, expected event related potentials representing neurocognitive correlates of deviance detection (mismatch negativity) and attentional orientation (P3b) were identified. However, the characteristics of these potentials partially varied depending on the environment, target position, and age group. In a follow-up study, we further explored the influence of additional visual target cues among older participants.

Older adults' learning interests, needs and challenges with AI tools.

by Lea Riniker¹ | Kathrin Inerle^{1, 2} | Burcu Demiray^{1, 2} ¹ Department of Psychology, University of Zurich ² Healthy Longevity Center, University of Zurich

In two studies, we examined older adults' learning interests, needs and challenges with AI tools. In the first online survey, we asked about experiences with ChatGPT. Our preliminary results (sample mean age 71.2; data collection ongoing) show that 58% have used ChatGPT and 81% would like to learn more about it. Their challenges included data security concerns, lack of efficient prompts and uncertainty about benefits. In the second online survey, we examined how avatar instructors in e-learning videos are perceived. A total of 146 adults (mean age 69.6) were randomly assigned to an experimental or a control condition. Control group watched an e-learning video with a human instructor, whereas the experimental group viewed the same content taught by an avatar. All participants took a quiz and evaluated the instructors. 54% of the avatar group reported noticing that the instructor was an avatar. The use of an avatar did not affect performance, as the two groups achieved the same quiz score. The human instructor was rated only slightly higher than the avatar in terms of gestures, sympathy, authenticity, and trustworthiness. Both instructors were perceived as similarly competent. Results are discussed in line with the importance and digital transformation of lifelong learning.

Stimulating and fun use of generative AI tools by older adults in a retirement village for producing digital stories.

by Sonja Pedell | Diego Muñoz | Lan An

Swinburne Living Lab, Swinburne University of Technology, Melbourne Australia

Generative AI (GenAI) has much potential, but many older adults are unsure how to gain value from it. Our research investigated the use of GenAI tools by older adults living in a retirement village for creating digital stories. The participants used GenAI for different purposes: generating images (Craiyon and DeepAI Image Generator) to depict dear memories in an exact manner, creating narratives (speech-to-text and text-to-speech generating different accents such as Scottish voices), and creating fun avatars with Bitmoji. We co-explored using these tools, with residents then trying them by themselves. Our ethnographic data from the one-year weekly engagement with five residents showed that using these GenAI tools for generating story content happened in creative and playful ways enabling them to decide if, how, and why to use the GenAI tools. Exploring GenAI applications, residents broadened the use of their own devices by learning about practical uses of AI, catering for personalised needs and develop new skills. Based on the data collected during the production process, residents talked competently and confidently about GenAI, justifying clear choices about when and how to use it to create an authentic story to convey to their audience. The findings suggest that teaching novel AI tools to older adults can be barrier-free, while being stimulating in offering a wide variety of image styles and audio choices. Moreover, group members were sharing unexpected results which often caused laughter and lively discussions. Older adults understood the technology and used the GenAI tools comfortably being able to explain the use to a broader audience upon completion of their stories.

Auto-Global Examination of Mental State (Auto-GEMS): a web-based cognitive screening.

by Mario Bonato¹ | Veronica Pucci¹ | Giulio Contemori¹ | Maria Silvia Saccani^{1, 2} | Giorgio Arcara² | Sara Mondini^{1, 2} ¹ University of Padova ² IRCCS San Camillo, Lido Venice

Recent methodological developments have contributed to a significant advance in computerised neuropsychological instruments and procedures. Here we present Auto-GEMS, a newly developed, web-based, screening test allowing to quickly estimate an individual's cognitive state also considering their cognitive reserve. Auto-GEMS can be administered from remote and it measures cognitive functioning on eleven items similarly to the in-person paper-and-pencil version (GEMS) and to the remote (phone or video call) version (Tele-GEMS) of the same screening. We collected normative data on a sample of 1308 Italian-speaking participants (age range 18–93) to verify its psychometric properties and computed regression models on demographic variables to establish clinical cut-offs. The psychometric properties of Auto-GEMS have shown good internal consistency, testretest reliability and convergent validity. This short and user-friendly tool has a number of potential applications. For instance, it can be useful in clinical practice to monitor the cognitive profile of patients or vulnerable individuals, or even administered in a face-toface, standard clinical setting. It can also be used in research studies to screen participants. The testing materials and the collected data are freely available in a digital archive along with a web App to visualise the test outcome with reference to its normative data.

Social cognition and interactions

Switching and social network size predict perspective-taking skills over the adult lifespan: Implications for future interventions.

by Madeleine Long | Sarah E. MacPherson University of Edinburgh

A cornerstone of human communication is our reliance on perspective-taking to guide linguistic interactions. However, this skill is prone to age-related decline, negatively impacting relationships and social well-being [1]. Here we set out to uncover the factors underlying this skill by testing adults (N=70, ages 19-79) using both a cognitive and social network approach.

A prevailing theory in psycholinguistics is that perspective-taking is mediated by cognitive control: i.e., inhibition and switching [2,3]. However, less consideration has been given to the role of social networks. Based on prior work which found associations between those with larger networks and an enhanced ability to understand and predict what someone will say [4, 5] and convey information [6], we hypothesised that having a larger network would increase sensitivity to partner-specific information, leading to enhanced perspective-taking. We also predicted switching and inhibition would play a role [2,3].

Our findings revealed that switching and larger networks were independently associated with enhanced perspective-taking. This has implications for future interventions aimed at improving perspective-taking across the lifespan.

References: [1] Lubben, J.E. & Gironda, M.E. (2003). [2] Brown-Schmidt, S. (2009). [3] Long, M. et al. (2018). [4] Lev-Ari, S. (2016). [5] Lev-Ari, S. (2019). [6] Lev-Ari, S., & Sebanz, N. (2020).

Spontaneous perspective-taking: age- and cultural-related differences.

by Anne-Lise Florkin¹ | Serena Stagnitto¹ | Alessia Rosi² | Gabriele Chierchia¹ | Floris van Vugt³ | Serena Lecce¹ | Elena Cavallini¹ ¹ University of Pavia ² IRCCS Fondazione Istituto Neurologico Nazione C. Mondino, Department of Neurology and Neurorehabilitation ³ University of Montréal

Perspective-taking is shaped by both age and culture. With age, egocentric interference often increases, complicating the shift to others' perspectives. Additionally, research suggests that collectivistic cultures may favor an egocentric perspective (representational theory), while others indicate that these cultures more easily shift to an alter-centric perspective (attentional theory). Despite these findings, few studies have explored age and cultural differences, or their interaction, in spontaneous perspective-taking. This study aimed to examine spontaneous perspective-taking tendencies in younger and older adults from both collectivistic and individualistic cultures, as well as the link between these tendencies and self-reported predispositions to take others' perspectives.

Participants included 83 younger (19–40 years) and 67 older (64–98 years) adults from an individualistic culture, and 25 younger (19–34 years) and 26 older (62–75 years) adults from a collectivistic culture, who completed a novel online spontaneous perspective-taking task. Results showed no significant age differences in spontaneous perspective-taking, though older adults required more time to adopt others' perspectives, suggesting increased egocentric interference. More collectivistic participants adopted a self-perspective, supporting the representational hypothesis, but no age-by-culture interaction emerged. These findings underscore the importance of investigating spontaneous perspective-taking across age and cultural contexts.

Grandchild caregiving and grandparents' cognition: effects of care status, care frequency, and care activities.

by Yvonne Brehmer | *Flavia S. Chereches* | *Gabriel Olaru* | *Nicola Ballhausen Tilburg University*

Previous research has linked higher frequency of grandchild care to better cognition and slower cognitive decline for grandparents. However, it is unclear whether these effects are driven by differences between caregiving and non-caregiving grandparents or if, among caregivers, the amount of caregiving influences later cognitive functioning. Additionally, we do not know if specific caregiving activities (e.g., playing, cooking for grandchildren) or the diversity thereof affect grandparents' cognition and whether these effects are only present for grandmothers or grandfathers. Thus, using latent growth curve models on three waves of ELSA data (N > 1000), we first compare caregiving grandparents to propensity-score matched non-caregiving grandparents on cognitive levels and decline. We then focus on caregiving grandparents, examining whether (a) caregiving frequency, (b) specific caregiving activities and (c) diversity of performed activities predict cognitive levels and decline. As past research reported gender differences in the effect of care on cognition, we run the analysis separately for the two genders. Our findings will clarify whether the positive effects of grandchild caregiving result from differences between caregiving and non-caregiving grandparents, if caregiving frequency and activity diversity impact later cognition, and whether these effects vary by gender.

The effect of changes in social participation during the transition to retirement on changes in cognitive functioning: Results from the Canadian Longitudinal Study on Aging (CLSA).

by Laurie Borel | Guillaume Vallet | Benjamin Boller Université du Québec à Trois-Rivières

Retirement is a major life change, often linked to cognitive decline regardless of age. This cognitive decline varies among individuals, and certain factors may be pivotal at this stage. Social participation is associated with better cognitive abilities in older adults, though it may vary over time, potentially due to retirement. The objective is to examine the evolution of social participation during the transition to retirement and its effects on cognition.

Firstly, we investigated how retirement affects social participation using data from the Canadian Longitudinal Study on Aging (CLSA) (Raina et al., 2009). The sample included 1,634 individuals who retired over three years, compared to 11,248 who stayed active during that period. Social participation measurement assessed the frequency of engagement in 8 different activities at each time point.

The results indicate an increase in social participation after retirement, notably in physical activities (F = 4.09, p < .001) and volunteering (T = 2.76, p < .001). Having obtained access to a third measurement time, we are currently analyzing the impact of these changes on cognitive evolution in retirement over a 6-year period. Our aim is to identify patterns of change that are likely to predict long- term cognitive trajectory.

Executive functions

Beyond linear decline: age-related trajectories of cognitive functions based on EEG data from the Dortmund vital study.

by Edmund Wascher | Stefan Arnau | Patrick D. Gajewski | Stephan Getzmann Leibniz Research Centre for Working Environment and Human Factor (IfADo), Dortmund, Germany

Traditional aging research often assumes a linear decline in cognitive functions, typically comparing young and older adults while omitting middle-aged populations. The Dortmund Vital Study challenges this simplified perspective through comprehensive neurocognitive assessment of over 600 participants aged 20-70 years. Here, we analyzed ten distinct neurocognitive experiments with multichannel EEG recordings. Using cubic modeling to analyze age-related progression, we identified variables where age accounted for >10% of variance. K-means cluster analysis revealed four distinct developmental patterns. Spectral parameters, particularly in theta and alpha frequency bands, demonstrated pronounced decline during early adulthood before stabilizing around age 40. While some measures, such as response times and specific ERP latencies, showed linear age-related decline, others exhibited unexpected patterns. Notably, performance in cognitive conflict tasks and visual search improved until approximately age 40, followed by accelerated decline. These findings highlight the heterogeneous nature of cognitive aging, suggesting that different cognitive functions follow distinct developmental trajectories. The results emphasize the importance of including middle-aged adults in cognitive aging research and challenge the traditional binary young-versus-old comparison approach. Our study provides crucial insights into the complex, non-linear patterns of cognitive development across adulthood, potentially reflecting diverse underlying physiological mechanisms.

The impact of cognitive load on insight and analytical problem solving in older adults.

by Febe Demeyer | Hans Stuyck | Céline R. Gillebert | Eva Van den Bussche KU Leuven

The increased life expectancy has made maintaining strong cognitive functions in later life more important than ever. However, most cognitive functions, including analytical problem solving, decline with age. Analytical problem solving typically involves a series of gradual and explicit steps that hone in on the solution and relies heavily on executive functions. In contrast, insight problem solving, characterized by a sudden realization of the solution into consciousness (i.e., the "Aha!" moment), relies more on implicit, automatic processes and appears less dependent on executive function resources. Evidence even suggests that decreased executive functions improves insight, thus potentially preserving or enhancing insight with age. We compared behavioral performance between older adults and intelligence-matched young adults during insight and analytical problem solving using the Compound Remote Associates task. We included three conditions with varying cognitive load to study the impact of taxing executive functioning on problem-solving performance. As expected, older adults were less accurate than young adults at analytical problem solving when no additional cognitive load impeded problem solving, and they generally used this analytical strategy less frequently than young adults. However, crucially, this age-related decline was not found for insight, suggesting that insight may be preserved as people age.

Age-related differences in cognitive flexibility as a process and as a trait and their intersection at the brain.

by Geraldine Rodríguez-Nieto | *Stephan Swinnen KU Leuven*

Cognitive flexibility facilitates the adaptation to new environments, resulting crucial in a rapidly changing and aging society. In this study, we aimed to study age-related changes in cognitive flexibility measured through a computer task and through self-reports ('Dependence on Routines' and 'Dogmatism'). In addition, we investigated whether cognitive flexibility as a trait modulated the brain activity during cognitive flexibility performance through fMRI. 40 young and 40 old adults participated in this study. The results showed differences in the initial performance of cognitive flexibility but these differences dissipated with learning. Furthermore, there were no significant differences in the flexibility selfreports between groups but there were important brain activity differences during cognitive flexibility performance. Remarkably, the Dependence on Routines trait modulated the BOLD activity in frontal regions in the young individuals and in subcortical regions in the older adults. In conclusion, cognitive flexibility as a cognitive process can be sufficiently distinguished of cognitive flexibility as a trait, and aging plays a distinct role in these components. Finally, cognitive flexibility as a trait seems to have a distinct influence during cognitive flexibility performance in both age groups. The consideration of different components of cognitive flexibility can facilitate intervention programs in older individuals.

Gaze behavior during walking in the real world with and without a search task in younger and older adults.

by Sophie Meissner¹ | Sabine Grimm² | Wolfgang Einhäuser² | Jutta Billino¹ ¹ Justus Liebig University Giessen ² Chemnitz University of Technology

Avoiding falls is a critical concern, especially for older adults, and an effective distribution of gaze plays an important role in it. In this study, we investigate whether gaze behavior during walking differs between younger and older adults and whether an explicit search task affects gaze distribution in the two groups differently. We instructed younger (N=24, M=26.1 years) and older (N=24, M=68.8 years) adults to walk through a hallway, either with or without the additional task to locate small target objects on the walls. Gaze behavior was recorded with mobile eye-tracking glasses. Additionally, we assessed executive function capability to examine its relationship with effective gaze distribution.

A key finding is that older adults oriented their gaze more towards the ground than younger adults; however, this difference was significantly attenuated when they were prompted to search for target objects. The age-related differences in ground dwell time during walking suggest a stronger prioritization of gait-related information in older adults – likely as a compensation strategy for age-related changes in gait stability. During the search task, older adults adapt their gaze behavior, potentially deprioritizing stable gait in such situations.

SYMPOSIA – OVERVIEW

Aula Magna

11.15-12.45 – Cognitive control Adult age sensorimotor performance: constraints and potentials for adaptation. Chair Ralf Krampe The influences of age and age simulation on Speakers Anna Lina implicit gross-motor sequence learning. Heggenberger Mihalis Doumas Effects of length of adaptation on sensory reweighting and perceptual delays in healthy young and older adults. Karen Li Effects of hearing and cognitive impairment severity on responsiveness to cognitive and exercise training in persons with mild cognitive impairment. Ralf Krampe Listening and postural control as multitasking challenges for middle-aged and older <u>adults.</u>

15.00-16.30 - Social cognition

Social cognition in old age: evidence on possible mechanisms and influence on everyday behavior.

Chairs Louise Phillips, Elena Cavallini, & Min Yong

Speakers	Sara Isernia	The role of neural integrity and experiential factors in reserve mechanisms for social abilities resilience: a lifespan perspective.
	Marios Bikas	The link between fiction consumption and Theory of Mind in older adults: a diary study.
	Elena Cavallini	<u>Theory of Mind in aging: an ecological</u> momentary assessment study.
	Hio Tong Pang	The relationship between age-based meta- stereotypes, face impressions, and intergenerational relationships.

Symposia – Abstracts

Cognitive control

Adult Age Sensorimotor Performance: Constraints and Potentials for Adaptation.

by Anna Lina Heggenberger¹ | *Mihalis Doumas*² | *Karen Li*^{3, 4} | *Ralf Krampe*⁵ *Chair: Ralf Krampe*⁵

¹ Saarland University, Saarbrücken, Germany

² School of Psychology, Queen's University Belfast

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Sensorimotor functions form the basis for mobility and communication both major factors determining optimal aging. Numerous studies have also demonstrated that sensorimotor and cognitive functions influence each other both at the level of individual aging trajectories and in settings requiring concurrent performances (multitasking).

The papers presented in this symposium target adult-age development in real-life sensorimotor skills like postural control, walking and motor-sequencing. Particular attention is given to the interaction of cognitive- and sensorimotor functions and possible way to improve performances in the elderly.

TALK 1: THE INFLUENCES OF AGE AND AGE SIMULATION ON IMPLICIT GROSS-MOTOR SEQUENCE LEARNING.

by Anna Lina Heggenberger Authors: Anna Lina Heggenberger | Janine Vieweg | Sabine Schaefer Saarland University, Saarbrücken, Germany

This study examines the effects of age and age simulation on gross-motor sequence learning, focusing on acquisition, execution performance, explicit recall and retention. Participants were divided into five groups: young adults aged 18- 25 years without (n = 14) or with (n = 15) an age-simulation suit, middle-aged adults aged 30-60 years without (n = 15) or with (n = 15) the suit, and older adults aged 60–85 years without the suit (n = 15). The suit reduces sensory perception, joint flexibility, and strength. Participants performed a fixed 10-element gross-motor sequence task requiring full-body movements with 28 practice trials. Explicit sequence recall was evaluated after acquisition, and a retention test followed on day 2. All groups demonstrated implicit sequence learning and were able to keep up their performance levels from the end of acquisition to the retention test on day 2. However, young adults without the suit had the fastest execution times and highest explicit recall scores. The suit significantly impaired execution performance and explicit recall in both younger and middle-aged adults, indicating that peripheral impairments can hinder explicit memory formation even when implicit learning remains intact. These results underscore the importance of considering both cognitive and sensorimotor factors in motor learning across the lifespan.

TALK 2: EFFECTS OF LENGTH OF ADAPTATION ON SENSORY REWEIGHTING AND PERCEPTIUAL DELAYS IN HEALTHY YOUNG AND OLDER ADULTS.

by Mihalis Doumas Author: Mihalis Doumas School of Psychology, Queen's University Belfast

Adaptation to new environments during upright standing, for example stepping on grass or sand, require sensory integration to maintain stability. Older adults' ability to adapt to unstable postural environments is intact, but their ability to de-adapt from the unstable environment and to perceive subtle changes in the environment show age-related slowing. The aim of this study is to assess whether these effects reflect a common mechanism of age-related decline in sensory processing. Postural sway was assessed in 40 young (age 18-35) and 40 older adults (age 70+) during upright stance on a fixed surface with eves closed (baseline, 2 minutes), followed by a sway-referenced surface (adaptation, short 1 minute or long 6 minutes) and then by a fixed surface again (reintegration, 3 minutes). Participants were asked to press a button whenever they perceived that the platform had started and stopped moving. Overall, older adults exhibited greater Anterior-Posterior swav path length. During adaptation, both groups showed a sway reduction, which was more pronounced in older adults, and in the long condition. Aftereffects were longer in the long adaptation condition, especially for older adults. Perceptual delays were longer for older adults but there were no differences between the short and long conditions. These findings suggest that the pronounced perceptual delay and postural sway aftereffects in older adults may be attributed to impaired sensory processing abilities, however the evidence for relationships between perceptual delays and postural aftereffects are inconclusive.

TALK 3: EFFECTS OF HEARING AND COGNITIVE IMPAIRMENT SEVERITY ON RESPONSIVENESS TO COGNITIVE AND EXERCISE TRAINING IN PERSONS WITH MILD COGNITIVE IMPAIRMENT.

by Karen Z. H. Li^{1,2}

Authors: Rachel Downey^{1,2*} | Berkley Petersen^{1,2} | Niroshica Mohanathas^{3,4} | Jennifer L. Campos^{3,4} | Manuel-Montero-Odasso⁵ | M.Kathleen Pichora-Fuller³ | Louis Bherer^{6,7,8} | Maxime Lussier^{5,7} | Natalie A. Phillips^{1,2} | Karen Z. H. Li^{1,2}

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Background: In older adults, cognitive and exercise training appears to improve cognitivemotor dual tasking (e.g., walking while performing a cognitive task). Impairments of hearing and cognition are linked with poor dual-task performance. However, it is unclear whether the severity of hearing or cognitive impairment moderates training efficacy. **Methods**: Secondary data analyses were performed with data from 75 participants with mild cognitive impairment (Mage = 73.66 ± 6.67 years). We investigated how subjective and objective hearing loss severity moderated the efficacy of a 20-week intervention trial. Participants completed Combined (ex + cog), Exercise (ex + sham cog), or Placebo (stretching + sham cog) training. Primary outcomes were measures of dual-task cognition and gait. **Results**: At baseline, greater subjective and objective hearing impairment severity predicted poorer dual-task gait and cognitive performance, for males. Dual-task gait variability only improved following Combined training in participants with greater subjective hearing loss. In participants with poorer subjective and objective hearing, lower cognitive performance (MoCA) predicted greater dual-task gait improvement following Combined training, and worsened gait following Placebo training. **Conclusions**: These results encourage a consideration of participant characteristics in order to better design training programs for older adults with mild cognitive impairment with or without hearing loss.

TALK 4: LISTENING AND POSTURAL CONTROL AS MULTI-TASKING CHALLENGES FOR MIDDLE-AGED AND OLDER ADULTS.

By Ralf Krampe¹

Authors: Ralf Krampe¹ | Mira van Wilderode² | Nathan Van Humbeeck¹ | Astrid van Wieringen² ¹ Brain & Cognition Group, Faculty for Psychology & Education, University of Leuven, Belgium ² Department of Neurosciences, Research Group Experimental ORL, University of Leuven, Belgium

We present data from three studies in which young, middle-aged and older adults performed auditory listening tasks concurrently with postural control tasks. Our experiments were inspired by naturalistic performance demands as they arise during a conversation at a reception. Processing demands of listening tasks either required speech identification or complex listening (memorizing words that were voiced by constant or alternating speakers). We use stabilogram-diffusion modelling to identify the component postural control processes affected by multitasking.

Results showed that even if cognitive demands of the listening task were minimal, postural control and listening interfered in middle-aged and older adults. Under ideal conditions (stable stance) middle-aged adults showed similar stability as young adults. However, concurrent complex listening demands disturbed their error correction such that stability suffered in multitasking conditions. In the third study middle-aged and older adults with speech-in-noise problems underwent intensive competing talker training. The intervention led to robust improvements in the trained task and transfer to speech-in noise tasks. Importantly, multitasking costs in concurrent postural control tasks at pre-test were reduced through listening training.

Our findings demonstrate that vulnerability of sensorimotor processes to multitasking occurs as early as middle adulthood. Early interventions can help to adapt to related everyday challenges.

Social cognition

Social cognition in old age: evidence on possible mechanisms and influence on everyday behaviour.

by Sara Isernia¹ | Marios Bikas² | Elena Cavallini³ | Hio Tong Pang⁴ Chairs: Louise Phillips⁴ | Elena Cavallini³ | Min Yong² ¹ IRCCS Fondazione Don Carlo Gnocchi ONLUS ² University of Bradford ³ Department of Brain and Behavioral Sciences, University of Pavia, Italy

⁴ University of Aberdeen

Age changes in cognitive processing extend into social realm. Although we now understand more about the pattern of age differences in social cognition, there is still a lack of knowledge about the mechanisms that might be important in patterns of aging and the influence of social cognitive shifts on everyday behaviour. In this symposium we hear about : (1) links between neural integrity, life experiences and social cognition across the lifespan (Isemia et al.), (2) diary-based evidence on associations between reading habits and social cognition in later life (Biskas et al.), (3) ecological momentary assessment of social cognition and its links to social relationships in younger and older adults (Cavallini et al.), and (4) the relationship between age-based social impressions and intergenerational relationships (Pang & Phillips). These different methodological approaches shed light on some of the factors that might influence social cognition in older age, and the possible consequences for everyday behaviour.

TALK 1: THE ROLE OF NEURAL INTEGRITY AND EXPERIENTIAL FACTORS IN RESERVE MECHANISMS FOR SOCIAL ABILITIES RESILIENCE: A LIFESPAN PERSPECTIVE.

by Sara Isernia Authors: Sara Isernia | Federica Rossetto | Giulia Smecca | Beatrice Mento | Diego Michael Cacciatore | Francesca Baglio IRCCS Fondazione Don Carlo Gnocchi ONLUS

Recently the role of lifetime experiential factors, such as cognitive-stimulating activities, in influencing cognitive performance has been reported in old age, likely compensating for the neural decline. However, while current evidence demonstrated a link between experiential factors and global cognitive level, little is known about this link in the social cognition framework. The present study explores if and when experiential factors contribute to sustaining social abilities over and above neural integrity. A cohort of healthy adults (young, 20-39y, adult, 40-59y, and old age, 60y+) underwent an MRI examination, a social cognition evaluation, and a questionnaire on cognitive-stimulating activities during life. By testing the link between social cognition performance and experiential factors, age emerged as a confounding variable, and an association was observed only when controlling for age. In the whole group, both neural integrity and experiential factors predicted social cognition performance. Interestingly, only long-life experiential factors (work; leisure time) were implicated. By considering age groups separately, the exclusive role of neural integrity was highlighted only at a young age, while the role of experience came up from the adult age replacing the neural integrity. The findings open up to the role of early cognitive reserve mechanisms for social abilities resilience.

TALK 2: THE LINK BETWEEN FICTION CONSUMPTION AND THEORY OF MIND IN OLDER ADULTS: A DIARY STUDY.

By Marios Biskas¹ Authors: Marios Biskas¹ | Min Young¹ | Louise Phillips² | Jemma Healey² | Hio Tong Pang² ¹ University of Bradford ² University of Aberdeen

Research suggests that fiction consumption enhances theory of mind (ToM), that is the ability to understand others' social communication, in younger adults. However, few studies have explored this link in older adults, despite evidence that this group has poor ToM ability, impacting cognitive and social functioning. Therefore, this study aimed to (i) explore how older adults engage with fiction and (ii) examine whether this engagement predicts ToM. To test this, we asked 62 participants aged over 60 to complete a diary for 21 consecutive days in-paper or online. Specifically, they completed measures assessing their daily fiction engagement, such as frequency, type, and modality, and three ToM tasks, that is the Eyes Test, Faux Pas task, and Social Stories Questionnaire. The results showed that participants commonly engaged with fiction by reading books and watching TV, favouring genres such as crime fiction and drama. Additionally, those who read more fiction had higher ToM accuracy, but this was unrelated to viewing and listening to fiction, b = 2.94, SE = 1.08, t(41) = 2.70, p = .010. These findings suggest that reading fiction relates to ToM in older adults, highlighting the potential of this activity for promoting social cognitive function and healthy aging.

TALK 3: THEORY OF MIND IN AGING: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY.

by Elena Cavallini¹

Authors: Elena Cavallini¹ | *Federico Curzel¹* | *Chiara Barattieri di San Pietro²* | *Lara Fracassi¹*, *Valentina Bambini²* | *and Serena Lecce¹* ¹ *Department of Brain and Behavioral Sciences, University of Pavia, Italy*

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Theory of Mind abilities (ToM) are crucial in social relationships. Decline in ToM, with difficulties in inferring others' thoughts, feelings, and intentions, has been observed in the aging population. Despite the importance of these abilities in everyday life, their investigation is limited to the assessment in lab setting. To overcome this hurdle, Ecological Momentary Assessment (EMA) methodology has recently started to be employed.

Aim of the present study was to assess age-related differences in the use of ToM and its association with wellbeing and social relationships via EMA. One hundred and sixty-two participants (82 young adults, aged 20-35, and 80 older adults, aged +65) were recruited. Participants answered a series of open and closed questions through an ad-hoc EMA protocol for seven days, five times a day. In addition, traditional tasks, assessing ToM performance, and questionnaires on wellbeing and social relationships were administered.

ToM use significantly predicted the wellbeing and satisfaction with social relationships, with a modulating effect of age. A different pattern of results emerged in the lab assessment, revealing a greater decline in ToM performance than in the ToM use.

Overall, our findings highlight the importance of EMA methodology for a deeper investigation of ToM in aging.

TALK 4: THE RELATIONSHIP BETWEEN AGE-BASED META-STEREOTYPES, FACE IMPRESSIONS, AND INTERGENERATIONAL RELATIONSHIPS.

by Hio Tong Pang Authors: Hio Tong Pang | Louise Phillips University of Aberdeen.

The beliefs about how people from another age group view us are called age-based metastereotypes. Recent studies indicated that first impressions reflect overgeneralised stereotypes of specific social groups to novel faces with similar features. This study explored whether age-based meta-stereotypes link to first impressions of faces and anticipated contact experiences. Age-based meta-stereotypes were manipulated (N = 260) for younger (17-30 years) and older (65-81 years) participants by reading paragraphs which conveyed positive or negative views from another age group. We assessed the effects of this metastereotype manipulation on participants' intergenerational anxiety, anticipated experience of intergenerational contact and first impressions of faces from different age groups. Results showed that the meta-stereotype manipulation influenced inter-generational anxiety and anticipated intergenerational contact in both younger and older adults. However, the meta-stereotype manipulation did not influence the impressions of age-outgroup faces. Our findings indicate that the valence of age-based meta-stereotypes induced by reading brief paragraphs can influence attitudes towards intergenerational contact, but not the impressions of faces. This has implications for our understanding of how age-based metastereotypes link to intergenerational relationships and for the design of future intergenerational interventions.

POSTER SESSION 1 – OVERVIEW

Cortile delle Magnolie

16.30-18.00 – Poster Session 1

1	Melanie Karthaus	Changes in personal characteristics and driving behavior in old age: results from the longitudinal study dobolsis.
2	Stephan Getzmann	Sources of resilience to work stress and burnout, the role of age, and a 5-year follow-up.
3	Katharina Sautter	<u>Age-differences in multi-digit arithmetic: an</u> <u>fNIRS study.</u>
4	Sabine Schaefer	The influence of age and age simulation on sorting and counting depends on cognitive load.
5	Christopher Atkin	<u>Clear decisions: perceptual clarity reduces age-</u> related deficits in decision-making.
6	Irene Ceccato	<u>Age-related differences in social problem-</u> solving: the role of theory of mind and cognitive functioning.
7	Anne-Lise Florkin	Do older adults struggle with Theory of Mind? A meta-analysis of task characteristics and age-related differences.
8	Federico Curzel	Advancing research on aging, social cognition, and well-being: the potential of Ecological Momentary Assessment (EMA) and methodological considerations.
9	Giulia Arenare	Caring minds: socio-cognitive abilities in the caregiver-care-recipient relationship.
10	Lara Fracassi	Are personal constructs related to Theory of Mind? Perspectives across adulthood.
11	Adriana Rostekova	The protective role of social connectedness in the relationship between increases in depressive symptoms and cognitive decline in older adults.
12	Gisele Menting	Towards conceptual clarity and corresponding instructions to measure cognitive and social activities for healthy brain aging.

13	Jana Isabelle Braunwarth	Do lifestyle factors predict compensatory ability in older adults? Evidence from a probabilistic learning task.
14	Kelly Wolfe	Collaborative learning with social robots in ageing.
15	Leah Ferguson	Assessing cognitive engagement variety vs. Frequency: a skill-learning intervention.
16	Shannon K. Runge	The influence of peer navigators on adherence and retention: a study within a randomized clinical trial of a cognitive intervention.
17	Grazia Cerullo	<u>Collaborative or individual training in older age:</u> <u>swift, a new tool to age successfully.</u>
18	Maximilian Haas	<u>Can self-administered virtual reality training</u> <u>enhance episodic memory? A feasibility study on</u> <u>home-based cognitive training in older adults.</u>
19	Luisa Knopf	<u>A comparison of the animacy effect in episodic</u> memory between young and older adults.
20	Sarina Siebenberg	Far transfer effects of a culturally adapted memory strategy training for older adults.
21	Sonia Paternò	Improving memory in the elderly: integrating strategic memory training and neurostimulation.
22	Emilie Joly-Burra	Training strategies and metacognition in older adults: efficacy of implementation intentions to foster completion of self-assigned prospective memory tasks.
23	Lena Müller	The benefit of a culturally adapted memory training for German older adults.
24	Ludmiła Zając-Lamparska	Effects of neuroplay neurofeedback training on cognitive functioning in post-stroke patients.
25	Tasmin Rookes	Preventing cognitive frailty: what people know and what they'd be willing to change.
26	Johannes Meixner	EEG biomarkers for differentiating pathological decline from normal cognitive aging: a cost- effective and non-invasive tool for longitudinal diagnostics.
27	Kerstin Jost	Resting-state EEG biomarkers for Alzheimer's dementia and cognitive decline.

28	Patrick D. Gajewski	<u>Changes of cognitive functions across the</u> <u>lifespan in seropositive and seronegative</u> <u>toxoplasma gondii adults.</u>
29	Alessandra Cucinelli	KCC2 as a novel pharmacological target for reversing age-related cognitive decline.
30	Eunye Lim	White matter hyperintensities in subjective cognitive decline: assessing the impact on cognitive function and exploring relationships with amyloid burden.
31	Geraldine Rodríguez-Nieto	Performance during complex action-selection predicts dorsolateral prefrontal GABA levels in older adults.

POSTER SESSION 1– ABSTRACTS

1. Changes in personal characteristics and driving behavior in old age: results from the longitudinal study DoBoLSiS.

by Melanie Karthaus¹ | Georg Rudinger² | Fabian Graas² | Edmund Wascher¹ | Stephan Getzmann¹ ¹ Leibniz Research Centre for Working Environment and Human Factors (IfADo) ² Uzbonn

Introduction: Many factors that influence driving safety change with age, such as sensory, motor, and cognitive functions or general health. However, it is unclear which of these age-related changes are also associated with changes in driving behavior. Aim of the longitudinal study DoBoLSiS was to identify critical factors whose age-related changes are most likely to impair driving abilities.

Methods: More than 400 older drivers (67-76 years) were examined up to four times over a period of 5 years. The participants were asked about their individual driving habits, attitudes toward driving, and general health, and underwent cognitive performance tests. Moreover, they completed a drive in the driving simulator at each measurement to record their driving behavior.

Results: There was no evidence of a general deterioration in driving ability with age over the study period. However, declining performance in reaction speed and changes in some specific cognitive functions (attention, inhibition, flexibility in task switching) as well as subjective self-assessments related to a risky driving style were associated with a decline in driving ability.

Discussion: The results suggest that individual differences in safety-related personal characteristics should be taken into account when developing and selecting interventions to maintain the driving ability of older drivers.

2. Sources of resilience to work stress and burnout, the role of age, and a 5-year follow-up.

by Stephan Getzmann¹ | Patrick D. Gajewski¹ | Yannick Metzler¹ | Mauro Larra¹ | Edmund Wascher¹ | Oliver Tüscher²

¹ Leibniz Research Centre for Working Environment and Human Factor (IfADo), Dortmund, Germany ² Leibniz Institute for Resilience Research (LIR)

Changes in the working world are leading to increased demands often associated with high levels of mental strain and occupational stress, especially for older employees. Different sources of resilience can play a role in the interplay between work demand, perceived stress and the development of burnout. Here, we studied possible benefits of cognitive reserve, physical fitness and social life in a sample of 519 employees aged 20-69 years from the Dortmund Vital Study (Clinicaltrials.gov NCT05155397) as well as their development in a 5- year follow-up in a subgroup of 154 employees. Perceived stress partially mediated the relationship between work demand and burnout. Resilience to work-related stress, as defined by Stressor Reactivity (SR) scores, was influenced by cognitive reserve, physical fitness and social life, with the influence of cognitive reserve decreasing with the age of the employees. However, only social life had an influence on resilience to stress-related burnout. This was also evident in the follow-up, with the age of the employees playing a minor role. Moreover, positive changes in resilience to burnout were associated with improvements in social life and physical fitness. Overall, the analysis confirmed long-term positive effects of physical fitness and social life on mental health in working life.

3. Age-differences in multi-digit arithmetic: an fNIRS study.

By Katharina S. Sautter¹ | Xinru Yao¹ | Elise Klein² | Christina Artemenko¹ ¹ Department of Psychology, University of Tuebingen, Germany ² LaPsyDÉ - UMR CNRS 8240, Université Paris Cité, Paris, France

Mental arithmetic is an important skill that older people need in everyday life to maintain their independence. While some cognitive abilities decline with age (e.g., working memory), arithmetic abilities (e.g., arithmetic fact knowledge, carry/borrow operations) might be preserved due to lifelong practice. This study investigates how aging affects the cognitive and neural mechanisms of multi-digit arithmetic by using functional near-infrared spectroscopy (fNIRS). Brain activation of older adults (> 60 years) is compared to younger adults in a three-digit addition and subtraction task with different levels of difficulty (0, 1 or 2 carry/borrow operations). Age-related differences in brain activation are expected in the fronto-parietal network of arithmetic processing, revealing the mechanisms for agerelated deficits, preservation or compensation. These findings will provide insights into the neural basis of arithmetic processing in higher age. First results will be presented at the conference.

4. The influence of age and age simulation on sorting and counting depends on cognitive load.

by Sabine Schaefer | Anna Heggenberger Saarland University

Handling and manipulating small objects may be compromised in older age due to declines in sensory abilities and fine-motor control. The current study used glasses that reduce near visual acuity and gardening gloves to simulate age-related constraints in young adults.
Young adults were randomly distributed across four experimental groups: no simulation (n=12), glasses (n=13), gloves (n=13), or both (n=11), and were compared to middleaged and older adults (age range 40 -77 years; n=17). Participants were instructed to sort and count 100 coloured chocolate lentils by colour over the course of 8 sessions. The number for each colour should be written down immediately after counting it (= no load), or only after all five colours had been counted (= load). Wearing gloves increased the counting times of young adults to the level of middle-aged and older adults. Working with a cognitive load as compared to no load increased counting times for older adults and for young adults without gloves, but the load-effect was absent in young adults with gloves. This indicates that young adults can "use" their slowed motor performance to increase cognitive processing, a compensatory strategy that is not available to older adults.

5. Clear decisions: perceptual clarity reduces age-related deficits in decisionmaking.

by Christopher Atkin¹ | *Kate Roberts¹* | *Hareth Al-Janabi²* | *Stephen Badham¹* | *Sam Perry²* ¹ *Nottingham Trent University* ² *University of Birmingham*

Making effective decisions becomes increasingly important with age (e.g., health, financial planning, autonomy), yet older adults often face challenges in decision-making due to agerelated changes in cognitive and perceptual processes. Age related declines in perception and cognition are not independent, raising the possibility that cognitive performance can be improved by reducing the cognitive load associated with decoding impoverished perceptual input. This study investigates the impact of perceptual clarity on decisionmaking performance in young (18-30 years) and older adults (75+ years). Participants completed decision-making tasks with perceptually clear and unclear written scenarios. The aim was to determine whether older adults experience reduced age-deficits in decisionmaking performance when presented with perceptually clear (vs unclear) information. Results showed that older adults benefited more from improved perceptual clarity than young adults. Findings contribute to understanding how perceptual factors influence decision- making, with implications for improving decision-making support for older adults. The results suggest that age-related deficits can be mitigated by improving perceptual clarity, either through independent strategies (e.g., wearing glasses, using magnifiers) and/or providing clear and accessible decision-making information.

6. Age-related differences in social problem-solving: The role of theory of mind and cognitive functioning.

by Irene Ceccato | Pasquale La Malva | Adolfo Di Crosta | Nicola Mammarella | Rocco Palumbo | Alberto Di Domenico Department of Psychology, "G. d'Annunzio" University of Chieti-Pescara, Italy

Research indicates that Theory of Mind (ToM) declines with age, yet the impact on older adults' social competence remains underexplored. This study examined age-related differences in social problem-solving (SPS) -the ability to manage socially challenging situations- while also investigating the specific contributions of ToM and cognitive functioning to this ability. Participants included younger adults (18–35) and older adults (65–85), who were presented with scenarios depicting embarrassing or awkward interpersonal situations. Each scenario required participants to generate and select potential resolution strategies. ToM was assessed using the Strange Stories task, while cognitive functioning was evaluated with a comprehensive battery including inhibition, shifting, updating, and reasoning. Preliminary results from 66 participants (36 older adults) showed no significant differences between age groups in the quality of generated solutions, although younger adults produced a greater number of solutions overall. Notably, older adults were more likely than younger participants to select solutions deemed optimal from a practical perspective but lacking in social sensitivity. The contributions of ToM and cognitive functioning to SPS were found to be modest, suggesting that social problem- solving competence is relatively independent of these abilities. This finding aligns with existing literature indicating preserved emotional and interpersonal competence in older adults.

7. Do older adults struggle with Theory of Mind? A meta- analysis of task characteristics and age-related differences.

by Anne-Lise Florkin | Daniele Gatti | Serena Lecce | Elena Cavallini University of Pavia

As people age, a decline in social interactions may occur, leading to reduced social cognition. Over a decade ago, a meta-analysis examined age-related differences in Theory of Mind (ToM), but since then, over 600 additional studies on this topic have produced mixed findings. We conducted an updated meta-analysis to determine whether older adults consistently show ToM impairments compared to younger adults, examining potential moderators such as task domain, modality, and task type, along with ecological validity and respondent perspective. Analyzing 67 studies across 69 datasets and 113 ToM tasks, we found that older adults generally face ToM difficulties, likely due to the inherent complexity of social cognition, as no task-related moderators showed significant effects. However, two-thirds of tasks had low ecological validity and primarily used a third-person perspective, limiting conclusions about these moderators. A recent review suggests that factors often missing in lab settings—such as capacity, motivation, and context—may exaggerate observed age-related ToM declines. This meta-analysis highlights the need for ecologically valid, second-person tasks to better assess whether these factors could improve ToM performance in older adults.

8. Advancing research on aging, social cognition, and well-being: the potential of Ecological Momentary Assessment (EMA) and methodological considerations

by Federico Curzel¹ | Serena Lecce¹ | Chiara Barattieri di San Pietro² | Valentina Bambini² | Alessia Rosi¹ | Lara Fracassi¹ | Elena Cavallini¹

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Socio-cognitive abilities, such as Theory of Mind (ToM) and pragmatics, are essential for quality of life and well-being but tend to decline with age. Traditional research methods, often reliant on paper-and-pencil questionnaires, provide only retrospective and indirect assessments of these abilities. Ecological Momentary Assessment (EMA), a method using smartphone apps to collect real-time data in naturalistic settings, offers a dynamic alternative by reducing recall bias and enhancing ecological validity. Despite its promise, EMA remains underutilized in studying socio-cognitive abilities, with limited exploration of its design, participant engagement, and methodological challenges. This study critically examines the use of EMA to assess the interplay between socio-cognitive abilities, social functioning, and well-being **in younger** (N = 80) and older adults (N = 76). It highlights EMA's strengths, such as its capacity to capture momentary fluctuations, while addressing challenges like cognitive and temporal demands on participants. By comparing compliance and responses across age groups, the study identifies opportunities and limitations in tailoring EMA to diverse populations. The findings underscore EMA's potential to advance research on aging and social cognition, as well as their impact on social functioning and well-being, while advocating for methodological refinements to enhance its accessibility and reliability.

9. Caring minds: socio-cognitive abilities in the caregiver-care-recipient relationship.

by Giulia Arenare¹ | Serena Lecce¹ | Sara Bottiroli | Alessia Rosi² | Irene Ceccato³ | Adolfo Di Crosta³ | Rocco Palumbo³ | Sonja Pedell⁴ | Elena Cavallini¹ ¹Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy ²IRCCS, Mondino ³Department of Psychology, "G. d'Annunzio" University of Chieti-Pescara, Italy ⁴Swinburne Living Lab, Swinburne University of Technology, Melbourne Australia

The caregiver-care recipient relationship is inherently complex and influences the psychological well-being and overall quality of life of the dyad. Indeed, a higher quality relationship is associated with reduced stress and increased satisfaction. Socio-cognitive abilities, such as the understanding of others' emotions and needs (Theory of Mind - ToM), may play a crucial role in promoting mutual understanding within caregiving dynamics. This study investigates the role of caregivers' socio-cognitive abilities in the caregiving relationship. Twenty-one healthy older adults and their informal caregivers (M age = 58.52, SD = 7.33) were assessed using both traditional and innovative measures of the quality of the relationship, including an observational assessment conducted during tablet-based activities designed to elicit dyadic interaction. Findings reveal that higher affective ToM predicts lower caregiver detachment (p = .024). Additionally, greater cognitive hypermentalization - the tendency to over-attribute mental states to others - predicts higher caregiver detachment (p = .044), whereas affective hypomentalization - the reduced or inaccurate attribution of mental state predicts greater caregiver harshness (p = .026). Finally, a trend emerged suggesting that higher overall ToM tends to predict greater caregiver sensitivity (p = .06). Overall, these results indicate that stronger caregivers' socio-cognitive skills are positively associated with a higher quality of the relationship.

10. Are personal constructs related to Theory of Mind? Perspectives across adulthood.

by Lara Fracassi | Elena Cavallini Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy

Relationships play a crucial role in an individual's emotional well-being, especially in older adults. During social interactions, various skills come into play, fundamental is Theory of Mind (ToM), which allows individuals to interpret their own and others' mental states (thoughts, emotions, desires). This skill is useful in predicting others' behaviours and seems to be linked, at least in part, to executive functioning. However, when anticipating actions, we also draw upon past experiences and therefore the mental schemas created from these experiences. To date, no study has analysed the association between these schemas and ToM. The aim of the present study is to examine the link between mental schemas, using the personal construct approach and ToM in young and older adults. The study involved 30 young adults (aged 20-30) and 30 older adults (over 65 years old), who were administered two ToM tests and an adaptation of Kelly's personal construct grid. The results highlight significant differences in personal constructs: elderly individuals report lower cognitive complexity and a decline in ToM with advancing age. Preliminary analyses show associations between personal constructs and mentalization skills and reveal age-related differences in these associations, which partially explain variations in ToM across adulthood.

11. The protective role of social connectedness in the relationship between increases in depressive symptoms and cognitive decline in older adults.

by Adriana Rostekova | Charikleia Lampraki | Andreas Ihle University of Geneva

Depressive symptoms are a well-documented risk factor associated with cognitive decline. On the other hand, social relationships can act as a protective factor when it comes to cognitive decline in the general population. However, there is a critical gap in the literature with regards to the potentially heightened significance of interpersonal connections for the particularly vulnerable population of older adults experiencing depressive symptoms. To address this gap, the proposed study will examine the link between interpersonal relationships and cognitive development of adults aged 50 years and above who report experiencing depressive symptoms using data from the Survey of Health and Retirement in Europe (SHARE, 9 waves). Using multilevel modelling and established measures of verbal fluency and delayed and immediate recall, we will investigate the role of social connectedness in cognitive performance and decline. Then, more nuanced analyses will investigate the contributing roles of living alone as well as of the size of the general social network versus the number of its members with very close emotional ties. The project aims to contribute to the growing body of research exploring the protective factors associated with cognitive ageing of this particularly vulnerable group.

12. Towards conceptual clarity and corresponding instructions to measure cognitive and social activities for healthy brain aging.

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Cognitive and social activities are associated with healthy brain aging and reduced dementia risk. However, lack of conceptual clarity hinders accurate measurement and intervention development. To address this, we are conducting an integrative review of 12,452 articles to extract definitions of cognitive and social activities. Screening is completed and data analysis is expected to be finalized by March. The findings will be triangulated with insights from an expert panel and results of already conducted semi-structured interviews with middle-aged and older adults (N=19, of whom 11 women; 7 less educated; 9 financially struggling; and 5 with a migration background). Thus far, recruitment specifically targeted lower SEP groups, as they are underrepresented in research despite potentially benefiting most from interventions that promote healthy brain aging.

Our preliminary results indicate that activities' cognitive and social value is highly contextual and personal. For instance, creative activities like knitting are cognitively engaging for some but not for others. This seems to depend on interest, prior experience, and novelty. By synthesizing these and many more insights, we aim to develop clear concept definitions to improve corresponding measurement tools and design interventions for diverse populations. This work ultimately contributes to promoting healthy brain aging among community-dwelling adults.

13. Do lifestyle factors predict compensatory ability in older adults? Evidence from a probabilistic learning task.

by Jana Isabelle Braunwarth | Nicola Kristina Ferdinand University of Wuppertal

As people age, learning tends to slow down and becomes less efficient. However, research suggests that emotional feedback can help mitigate these deficits by compensation. This study examined whether lifestyle factors like social participation and physical exercise can predict the extent to which older adults benefit from emotional feedback during learning. In this study, N=82 healthy older adults with a mean age of 70.6 years (SD=5.23) completed a probabilistic learning task, receiving emotional and non-emotional feedback. Questionnaires assessed social participation and physical exercise across three dimensions: importance, recent engagement, and long-term engagement. Hierarchical regression analyses were used to explore the impact of these lifestyle factors on learning outcomes. The analyses revealed that emotional feedback improved learning, as indicated by higher accuracy and faster reaction times. Social participation did not significantly enhance learning from emotional feedback. Physical exercise, however, showed a significant impact, although more physically active participants exhibited a smaller benefit in reaction times after emotional than nonemotional feedback. This may suggest that physically active individuals may not need to recruit compensatory mechanisms as much as less active individuals. Future research should focus on refining measures of social participation to better understand its role in learning from emotional feedback.

14. Collaborative learning with social robots in ageing.

by Kelly Wolfe¹ | *Sarah E. MacPherson²* | *Mauro Dragone^{1,3}* | *Malwina Niechciał¹* ¹ *Heriot-Watt University* ² *University of Edinburgh*

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As we age, learning becomes more challenging due to age-related changes to cognitive abilities (such as working memory, and processing speed). There is evidence that collaborative learning can benefit older adults due to its social component. However, this requires an existing social network, which is not available to all older adults. In recent years, the use of robots has become more common in assisting older adults with cognitive decline and there may be benefits in using robots to support learning in healthy older adults. The current study examined older adults' long-term learning benefits from learning with a collaborative partner, as well as differences in performance between types of partners, and participants' strategy use and level of interaction with their collaborative partner.

A total of 30 healthy older adults (aged 60 years or older) participated in a collaborative learning task with a human, robot, or digital assistant. They also completed a cognitive test battery and were assessed on their task recall after 7 days to assess long-term benefits. At this time, all data has been collected and is being analysed by the research team, with analyses projected to have been completed before the EUCAS conference in May.

15. Assessing cognitive engagement variety vs. frequency: A skill-learning intervention.

by Leah Ferguson¹ | Arash Mehrkesh¹ | Esra Kurum¹ | George W. Rebok² | Rachel Wu¹ ¹ University of California, Riverside ² Johns Hopkins Bloomberg School of Public Health

Cognitive aging research has suggested that the more variety an individual has in their dayto-day activities, the more protective this may be against age-related decline in healthy older adults. However, much of this research utilizes observational data and has not been assessed in an experimental intervention design. The present study examined the effects of skill-learning frequency and variety on cognitive abilities with older adults in a 2x2 intervention design. This 8-week intervention randomly assigned 71 community-dwelling older adults (80.3% female, Mage = 70.49 years) to four conditions combining high or low frequency of learning and high or low variety of skills learned including drawing, music composition, Spanish, singing, or acting. Due to the restriction of COVID-19 pandemic, participants only completed baseline, pre-test, and 2-year follow-up cognitive in-person assessments for working memory and cognitive control. Latent change score models for the cognitive domains revealed that higher variety of skill learning predicted more improvement in working memory compared with lower variety, while frequency demonstrated no significant effect. Our findings suggest that even a couple hours of varied skill learning per week may positively impact cognitive health, though individual differences should be considered.

16. The influence of peer navigators on adherence and retention: a study within a randomized clinical trial of a cognitive intervention.

by Shannon K. Runge¹ | Elizabeth M. Hudak² | Jade A. Sutfin¹ | Victor R. Dobrovolskiy¹ | Jerri D. Edwards¹

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Introduction: Participant adherence and retention are critical to investigations of cognitive interventions, yet successfully engaging older adults in clinical trials can be challenging. Peer navigators, trained laypersons with similar experiences as trial participants, may positively influence participant engagement. This study within a trial (SWAT) examined whether peer navigators influenced adherence and retention in a clinical trial of cognitive interventions among older adults.

Methods: Data from 268 community-dwelling older adults enrolled in a cognitive intervention study were analyzed. A subsample of participants (n=36) were each assigned a peer navigator, a former participant who had completed the trial. Independent samples ttest and Chi-square test assessed the effects of navigator assignment on intervention session completion and study retention.

Results: Participants assigned to a navigator completed 4.1 more intervention sessions on average, t(134.2)=-6, p<.001 and were more likely to complete the study, X2(1, n=261)=10, p=.002. All participants assigned a navigator completed the study, compared to 76% without a navigator.

Discussion: Among a sample of relatively healthy community-dwelling older adults, peer navigators improved participant adherence and study retention in a clinical trial of cognitive intervention. Results highlight the value of personalized peer support to maintain participant engagement in a clinical trial.

17. Collaborative or individual training in older age: SWIFT, a new tool to age successfully.

by Grazia Cerullo¹ | Sabrina Cipolletta¹ | Fabio Le Piane² | Mauro Gaspari² | Giovanna Mioni¹ | Sara Zuppiroli² | Matthias Kliegel³ | Alexandra Hering⁴ | Nicola Ballhausen⁴ | Franca Stablum¹

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Ageing is associated by a multitude of changes in cognitive abilities, such as executive functions (e.g., planning and problem-solving), which in turn affect wellbeing and quality of life. Stimulating these abilities could help maintain independence. On the other hand, cooperation within small groups may reinforce the stimulation effects and promote self-efficacy and self-consciousness.

Thus, a programme that combines a training in these abilities with a collaborative setting may be a successful way to promote active ageing. Shared, Web-based, Intelligent Thinking Training (SWIFT) is a new AI tool that aims to enhance problem solving abilities by simulating a real-life scenario, in a collaborative or individual setting.

A study was conducted to verify the effectiveness of SWIFT. A sample of 30 older adults (age: 65-85) was randomly assigned to receive either collaborative or individual training.

The training consisted of 2 sessions per week for a total of 10 sessions, in which the participants had to plan a 2-day trip in Rome by booking hotels, buying train tickets, and moving around on a virtual map of the city.

By comparing the two training settings, it is interesting to point out differences in the learning rhythm and modalities and in the effects on the cognitive performance.

18. Can self-administered virtual reality training enhance episodic memory? A feasibility study on home-based cognitive training in older adults.

by Maximilian Haas | *Pauline Berthouzoz* | *Deian Popic* | *Corinna Martarelli UniDistance Suisse*

This study investigates the potential of a self-administered virtual reality (VR) training program to enhance episodic memory, while also assessing its feasibility for use in older adults (aged 65 years and above). Twenty participants will complete eight training sessions over a 14-day period from their own homes using a fully immersive head-mounted display, engaging in a VR-based "Shelf Task": In each session, participants are required to accurately place eight distinct objects on a virtual shelf, memorize their location, and then replace them according to their correct spatial position. Visual feedback of their performance is provided post-trial. Each training session includes 10 trials with different sets of 3D objects each. Additionally, participants complete questionnaires measuring

motivation, perceived task difficulty, daily stress, and self-confidence. Pre- and post-study laboratory sessions, including different memory tasks (e.g., California Verbal Learning Test), will evaluate potential cognitive transfer effects beyond the trained task. This study will provide first insights into the feasibility and potential cognitive benefits of the VR-based "Shelf-Task". More generally, the findings from this study may guide future research on the applicability of immersive VR-based cognitive training in aging populations.

19. A comparison of the animacy effect in episodic memory between young and older adults.

by Luisa Knopf¹ | Meike Kroneisen² | Edgar Erdfelder³ | Siri-Maria Kamp¹ | ¹ Trier University ² RPTU ³ University of Mannheim

A large body of studies has demonstrated that animate things (such as animals or humans) are better remembered than inanimate objects. This feature of human episodic memory may have developed during evolution to optimize conditions for survival. The mechanisms behind the animacy effect remain unclear, with different explanations emphasizing elaboration during encoding, attentional capture or linguistic factors. These theories lead to different hypotheses regarding potential age differences in the effect. In the present study, we hence examined the animacy effect in young and older adults and recorded EEG data during the task to gain insight into its underlying neural mechanisms. Both age groups showed a significant animacy effect. Event-related potentials during encoding revealed that the N400 component tended to be attenuated for animates, potentially suggesting facilitated semantic access for these items. Since the animacy effect appears to be intact in older adults, potentially due to interactions of age-invariant semantic processes with episodic memory, interventions to compensate for episodic memory decline may be developed on the basis of these results.

20. Far transfer effects of a culturally adapted memory strategy training for older adults.

by Sarina Siebenberg | Lena Müller | Donja Sockara | Jutta Kray | Saarland University

Cultural background appears to influence memory strategy effectiveness, with Westerners favoring categorical grouping and self-referencing, while Easterners prefer relational grouping, with both self- and other-referencing being effective. These differences may become more pronounced with age due to accumulated experience with applying those strategies. In our training study, older adults (60-80 years) practiced one culturally preferred and one non-preferred memory strategy (Gr. 1: relational grouping/selfreferencing, Gr. 2: categorical grouping/other-referencing) over three sessions. We assessed far transfer effects on item and associative memory by measuring total words recalled and learning rates in the Auditory Verbal Learning Test (AVLT) as well as in a paired-associate learning test (PALT), comparing results to an active control group engaged in a decisionmaking task. We hypothesized that applying trained culturally preferred strategies to nontrained tasks (AVLT, PALT) would lead to greater improvements. Preliminary analysis of German participants revealed that in the AVLT, groups differed in learning rates at baseline, but all showed improvement post-training. Younger German participants recalled more words than older participants in both tasks. Notably, in the PALT, only older participants improved from pre- to posttest regarding the total number of words recalled.

21. Improving memory in the elderly: integrating strategic memory training and neurostimulation

by Sonia Paternò^l | Alice Valcarenghi² | Gabriele Manna^l | Chiara Ferrari^{l,3} | Sara Bernini³ | Elena Cavallini^l | Sara Bottiroli^{l,3} |

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Memory decline constitutes a significant challenge in aging, affecting older adults' daily lives. Strategic memory training has been shown to enhance memory abilities in older individuals more effectively than adaptive memory training, facilitating generalization over other tasks. While combining adaptive memory training with transcranial direct current stimulation (tDCS) appears beneficial for memory enhancement, no studies have investigated coupling strategic memory training with tDCS.

The present study aims to determine whether the integration of tDCS with strategic memory training leads to greater improvements in memory performance compared to strategic memory training alone.

Sixteen healthy older adults attended five strategic memory training sessions, while tDCS was applied over the left dorsolateral prefrontal cortex (DLPFC). Ten participants were randomly assigned to the experimental group (Mage=71,30 years, Meducation=15,10 years) receiving real anodic tDCS, and six to the control group (Mage=69,50 years, Meducation=13,50 years) receiving sham tDCS. Their performance in an associative memory task was evaluated before training (T0), immediately after (T1), and at one-month follow-up (T2).

Preliminary data indicate a significant improvement in the associative memory task execution between T0 and T1, although tDCS did not significantly enhance their performance. A larger sample size may clarify the potential benefits of this combined approach.

22. Training strategies and metacognition in older adults: efficacy of implementation intentions to foster completion of self-assigned prospective memory tasks.

by Emilie Joy-Burra | Sascha Zuber | Anne-Claude Juillerat Van der Linden | Matthias Kliegel University of Geneva

Training memory strategies without addressing strategy adaptation and generalization often fails to produce transfer to untrained tasks, particularly in everyday memory contexts. To overcome these limitations, this study provided healthy older adults (ages 65–88) with psychoeducation on memory and metacognition and trained them on mnemonic and selfregulation strategies, including implementation intentions (II) and stop-think-plan-act (STPA). Over six weeks, participants attended group sessions and completed personalized follow-ups with daily prospective memory (PM) diaries to track self-assigned tasks and strategy use.

Using at least one trained strategy more than doubled the likelihood of completing selfassigned PM tasks. The efficacy of self-regulation strategies (II and STPA) varied by age: older-old adults (\geq 81 years) benefited most (OR = 4.94), followed by those in their 70s (OR

= 2.61). Younger-old adults showed smaller gains, highlighting age-related differences in

strategy effectiveness. When looking at II specifically, the strategy was especially useful for tasks that were difficult, non-urgent, or familiar, making it particularly effective for overcoming procrastination.

This study demonstrates the potential of tailored cognitive training to improve everyday PM in older adults. Integrating metacognition and self-regulation strategies Thus appears critical for addressing real-world memory challenges and supporting independence and well-being in aging populations.

23. The benefit of a culturally adapted memory training for German older adults.

by Lena Müller | Sarina Siebenberg | Jutta Kray Saarland University

Cross-cultural differences in strategy use for memorizing items and their source are assumed to be more pronounced in older age given the long-term experience in applying specific strategies across the lifespan. There is some evidence that Westerners prefer categorial grouping and self-referencing for memorizing, while Easterners prefer relational grouping and show no differences between self- and other-referencing strategies. Here we designed a training study in which older adults (60-80 years) practiced one culturally preferred and one culturally non-preferred memory strategy (Group1: relational grouping/self-referencing; Group2: categorical grouping/other-referencing) in three training sessions. Transfer effects were determined as performance benefits at posttest relative to pretest in item and source memory and compared against performance benefits of an active control group performing a gambling task. We expected larger transfer effects in the two memory tasks, when older adults were trained in the culturally preferred strategy. Preliminary findings from the German sample only showed memory improvements in all groups in both tasks. That is, we found a significant increase in hit rates in the referencing and the grouping task. In contrast to our expectations, these improvements were neither specific to strategy use nor to the type of strategy.

24. Effects of NeuroPlay neurofeedback training on cognitive functioning in post-stroke patients.

by Ludmila Zając-Lamparska¹ | Monika Wiłkość-Dębczyńska¹ | Daria Kukuła¹ | Anna Werońska² ¹ Kazimierz Wielki University in Bydgoszcz, Poland ² NeuroPlay - YOT MED Sp. z o.o.

Multifaceted rehabilitation strategies are crucial for improving stroke patients' cognitive functioning and quality of life. Neurofeedback methods' usability for stroke patients' rehabilitation has been known for decades. However, the technique is not commonly used despite its relatively low cost. Furthermore, controlled studies demonstrating the specific effects of neurofeedback on intervention for post-stroke cognitive impairments are rare.

The presented study aimed to evaluate the effect of neurofeedback training using the NeuroPlay solution on cognitive functioning in post-stroke individuals.

The study sample included 94 patients, comprising 33 in the experimental group, 38 in the passive control group, and 23 in the active control group. Participants in the experimental group attended 16 neurofeedback training sessions spread over 4 weeks. Participants in the active control group participated in the same schedule of cognitive function exercises using paper-and-pencil tasks. The passive control group was a no-contact group.

The results indicate that NeuroPlay training significantly improved the overall score on the Mini-Mental State Examination test, the scores of part of the Addenbrook Cognitive Examination III subscales, namely attention, verbal fluency, and language, correctness in the continuous performance task, and the comprehension, expression, and reading indices of the S.O.D.A. test.

25. Preventing Cognitive Frailty: what people know and what they'd be willing to change.

by Shaimaa Elhag¹ | Tasmin Rookes² | Ruoyu Wang³ | Mohaddeseh Ziyachi⁴ | Millennium Iyobuchiebomie⁵ | Alan Gow¹ ¹ Heriot-Watt University

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Background: While cognitive frailty (CF) can be prevented or delayed, existing research focuses on mid- and older adults. The perspectives of diverse populations, including nonfrail, younger adults have often been omitted.

Aim: The study aims to assess public knowledge of CF prevention and explore people's willingness and ability of individuals to engage in preventive behaviours across different age groups.

Methods: A survey will be distributed to adults aged 21 and above, in the UK, capturing data on beliefs regarding CF risks, current cognitive health activities, and willingness to make future lifestyle changes.

Results: Chi-square tests and regression models will be utilised to identify age-related differences in CF awareness and preventive behaviour likelihood. The analysis will highlight variations in beliefs about CF and engagement in preventive actions across age groups, providing insights into the demographic barriers that influence behaviour change. Results will be available and presented at the conference.

Conclusions: Understanding these factors will offer valuable insights into public perceptions of CF, facilitating the development of targeted and relevant behaviour change interventions to reduce CF risk and enhance cognitive and physical health across the lifespan.

26. EEG biomarkers for differentiating pathological decline from normal cognitive aging: a cost-effective and non-invasive tool for longitudinal diagnostics.

by Johannes Meixner | Hannah Scheibner | Martin Heinze | Volker Dahling | Kerstin Jost Brandenburg Medical School, Neuruppin, Germany

Differentiating pathological decline from normal cognitive aging remains a challenge. Electroencephalography (EEG) offers a cost-effective, non-invasive alternative to imaging and cerebrospinal fluid analysis for identifying biomarkers associated with cognitive decline and dementia. The ADEEG study evaluates the diagnostic and predictive potential of resting-state EEG (rsEEG) and event-related potentials (ERP) to distinguish between cognitively normal individuals (NOLD), those with mild cognitive impairment (MCI), and Alzheimer's disease dementia (ADD). Key objectives include identifying EEG biomarkers that differentiate these groups, exhibit high sensitivity and specificity, correlate with neurocognitive performance, and predict cognitive deterioration. Eighty participants (20 ADD, 24 MCI, 36 NOLD) from memory clinics at Brandenburg Medical School underwent comprehensive clinical, neuropsychological, and neurophysiological assessments, including rsEEG and ERP measures targeting attention (auditory oddball task), working memory (n- back task), and episodic memory (face-name association task). Initial results reveal group differences: rsEEG "slowing" indicating cortical impairment, delayed and reduced P3 amplitudes in the oddball task reflecting attention deficits, and diminished ERP-PN amplitudes in the n-back task indicating working memory decline. In addition, these biomarkers were predictive of cognitive and memory performance one year and two years later. The findings underscore EEG's potential to improve longitudinal diagnostic pathways and support early intervention in neurodegenerative diseases.

27. Resting-state EEG biomarkers for Alzheimer's dementia and cognitive decline.

by Kerstin Jost¹ | Oliver Labrenz¹ | Moritz Hegert¹ | Johannes Meixner¹ | Patrick Gajewski² | Stephan Getzmann² | Edmund Wascher² | Hannah Scheibner¹ | Volker Dahling¹ | Patrick Khader³ ¹ Brandenburg Medical School

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Cognitive decline is linked to alterations in resting-state EEG, including a "slowing" of the EEG and reduced alpha reactivity. While these markers are well-documented in group comparisons, their use in individual diagnostics requires an understanding of (1) their interrelations and dynamic interactions, and (2) their specificity for Alzheimer's dementia (AD) beyond normal aging. We analyzed resting-state EEG (eyes open vs. closed) in two samples: (1) >300 participants (20-70 years) from the Dortmund Vital Study (Clinicaltrials.gov: NCT05155397) to investigate age effects, and (2) >70 older adults from the ADEEG study, categorized as cognitively normal, mild cognitively impaired, or AD. AD was associated with reduced alpha reactivity, elevated delta power, and a lower alphatheta transition frequency (TF), whereas individual alpha frequency and alpha peak power were not specific for dementia but also obvious in normal aging. Exploratory factor analysis identified two independent EEG components, a frequency and a power component. Preliminary data indicated that the specific combination of alpha-delta power differences with TF achieved the highest accuracy for distinguishing AD from cognitively normal participants in ROC analyses, highlighting its potential as a diagnostic biomarker. These findings provide new insights into EEG-based markers for cognitive decline and their application in clinical settings.

28. Changes of cognitive functions across the lifespan in seropositive and seronegative Toxoplasma gondii adults.

by Patrick D. Gajewski | Klaus Golka | Jan G. Hengstler | Jörg Reinders | Edmund Wascher | Stephan Getzmann

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About one-third of humans worldwide show Toxoplasma gondii (T. gondii) positive antibody status. Recent findings showed serious consequences of latent infection on the central nervous system, leading to cognitive impairments. However, little is known about the temporal dynamics of the changes. The present study aims at evaluating the course of cognitive changes across the adult life span in relation to latent T. gondii infection. In a double-blinded design data of 253 seropositive and 476 seronegative adults aged between 20 to 88 years were compared in respect to cognitive functions, such as memory, attention, and executive functions. The results show superior cognitive performance in infected vs. non-infected young to middle aged adults and a reversed pattern in older age. Specifically, this interaction between age and T. gondii was evident in short-term and working memory, learning ability, immediate recall, as well es interference processing in a Stroop task and switching ability evaluated with Trail Making Tests. These findings support a recently proposed model of dynamically changing effects of T. gondii on central nervous system with increasing age. Because of the high prevalence of asymptomatic T. gondii and an increasing population of older adults this finding is of high relevance for public health.

29. KCC2 as a novel pharmacological target for reversing age-related cognitive decline.

by Alessandra Cucinelli¹ | Ilaria Colombi¹ | Federica Piccardi² | Maria Bolla¹ | Tiziana La Bella³ | Marco Borgogno⁴ | Giuseppe Ronzitti³ | Marco De Vivo⁴ | Andrea Contestabile¹ | Annalisa Savardi¹ | Laura Cancedda¹

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Aging leads to the buildup of cellular and molecular damage, also affecting the central nervous system. This results in cognitive and memory deficits, dementia, sleep disturbances. Additionally, some elderly individuals experience adverse reactions to benzodiazepines. The literature indicates GABA as fundamental in memory formation and potentially involved in age-related cognitive decline. Two key players in maintaining the correct balance between neuronal excitation and inhibition through GABAA-receptor signalling are the chloride importer NKCC1 and the chloride exporter KCC2. Here, we identified a significant difference in KCC2 expression in the hippocampi of elderly mice (24-month-old) and elderly people (over 75 years old), when compared to control mice (2-monthold) and young adult people (20-25 years old). Moreover, we found that the KCC2 expression dysregulation might be possibly due to post-translational modifications (i.e., phosphorylation). Furthermore, in in vivo calcium-imaging experiments, aged mice presented an altered inhibitory response to benzodiazepines. Pharmacological targeting of KCC2 by two different compounds rescued the age-associated cognitive impairment, which we observed in behavioural studies. Finally, direct KCC2-expression manipulation in the CA1 region of young mice induced cognitive impairment. Altogether, our studies suggest KCC2 as a possible target to rescue cognitive impairment during elderliness.

30. White matter hyperintensities in subjective cognitive decline: assessing the impact on cognitive function and exploring relationships with amyloid burden.

by Eunye Lim | Dongwon Yang Department of neurology, College of Medicine, Catholic University of Korea

Objective: To assess the impact of regional white matter hyperintensity (WMH) volume on cognitive function in individuals with subjective cognitive decline (SCD) and investigate its relationship with amyloid burden.

Methods: A cohort study in South Korea focused on predicting progression from SCD to cognitive impairment or dementia. Demographic and clinical data were analyzed, stratified by WMH severity in SCD. Statistical comparisons were made among quartiles of WMH volume. Multiple regression analyses explored associations between regional WMH volume, standardized uptake value ratio (SUVR), and cognitive function.

Results: Examining 120 SCD patients, 78.3% had negative amyloid PET scans. Higher WMH volume quartiles correlated with older age, increased diabetes prevalence, and elevated SUVR in the precuneus and cuneus region. Higher WMH was linked to poorer processing speed and executive functions. Significant associations were found between posterior periventricular WMH volume and precuneus/cuneus SUVR values. Conversely, posterior deep WMH volume correlated with age and Framingham Score, not regional amyloid burden.

Conclusion: This study suggests that WMHs and amyloid burden independently influence cognitive function in SCD patients.

31. Performance during complex action-selection predicts dorsolateral prefrontal GABA levels in older adults.

by Geraldine Rodríguez-Nieto | Amirhossein Rassooli | Hong Li | Sima Chalavi KU Leuven

GABA is an important neurotransmitter in the brain that allows the modulation of neural activity and sophistication of a wide range of cognitive functions, including movement and action selection. Magnetic Resonance Spectroscopy (MRS) studies have consistently showed a decrease of GABA in older adults. Nonetheless, the relationship between GABA levels during cognitive performance and behavioral quality in this age group has been scarcely investigated. In this study, 20 young and 20 older adults performed an action selection task during the MRS session: GABA levels were measured from the sensoriomotor and the dorsolateral prefrontal cortices. In the action selection task individuals were requested to perform different movement patterns varying in complexity. The results showed that the behavioral performance in the difficult trials predicted the GABA levels in the dorsolateral prefrontal cortex during the performance of the task (but not during baseline) in older adults. In particular, a faster performance in difficult trials of action selection was related to

higher GABA levels. These results highlight the prominent role of dlPFC GABA in the execution of complex motor patterns in older adults.

Friday, May 9th

KEYNOTE SPEAKERS – OVERVIEW

Michael Wagner

Subjective Cognitive Decline in Aging and in Alzheimer's Disease

Affiliation: Department of Cognitive Disorders and Old Age Psychiatry and DZNE, German Center for Neurodegenerative Diseases, University Hospital Bonn, Bonn, Germany.

Subjective Cognitive Decline (SCD) is a research concept capturing the concerns of elderly individuals regarding their diminishing cognitive abilities. While such concerns are rather frequent, related to affective symptoms, and not necessarily reflect objective decline, SCD is associated with a higher risk of developing dementia, often caused by Alzheimer's Disease (AD). Some features of SCD, including onset, consistency, worries and help-seeking, increase the predictive validity of SCD. After addressing the definition and measurement of SCD, I will summarize what we know today about the temporal association of SCD with preceding and subsequent memory decline, and with neurobiological mechanisms. In particular, I will review how SCD emerges in the early, preclinical stage of AD, which can now be well characterized by in-vivo biomarkers of amyloid and tau pathology. Elderly subjects, despite such AD pathology, may never develop AD dementia during their lifetime, which is why biomarker screening for AD in fully asymptomatic individuals is advised against. However, those who also have SCD often show subtle objective deficits or problems with everyday activities noticed by others, and progress more likely and more rapidly towards Mild Cognitive Impairment and dementia. As robust blood-based AD biomarkers and disease-modifying treatments for AD will become available, SCD could indicate a clinical window for the early detection and treatment of Alzheimer's Disease.

Fabienne Collette

How changes in brain activity may help to preserve cognitive performance during healthy aging.

Affiliation: GIGA-CRC Human Imaging, University of Liège, Belgium

The advent of neuroimaging techniques since the 1990s has made it possible to investigate the neural substrates of age-related cognitive changes. Integrity of prefrontal areas was initially proposed as responsible for lowered performance when the tasks require controlled processes – the frontal lobe hypothesis proposed by West in 1996. In the next decades, observation of brain activity with PET and fMRI techniques during episodic memory and executive tasks showed that aging is associated with both increase and decrease of activity, reduction in left-right brain activity asymmetry, and shift between activity in anterior and posterior areas. Interestingly, recruitment of these alternative brain networks was sometimes associated with good cognitive performance, challenging the notion that changes in brain activity during aging is a marker of decline for high-level cognitive processes. Neuroimaging data also led to the proposal that life course experiences, and biological and health characteristics allows the constitution of cognitive and brain reserve that help to counteract the effect of aging on cognition. These data will be gathered to provide an integrative view of age-related changes in high-level cognitive processes, and their relevance to understand mechanisms favoring cognitive health in aging will be discussed.

ORAL TALKS – OVERVIEW

09.45 - 11.15 – Cognitive training

Aula Volta

CHAIR OF THE SESSION – Sara Bottiroli

09.45-10.05	Andrea Protzner	Are individual EEG connectome features more substantial than group effects in younger and older adults?
10.05-10.25	Ludmila Zajac- Lamparska	Investigating the role of cognitive training in facilitating compensatory scaffolding in older adults: an EEG measurement approach.
10.25-10.45	Alexandra Hering	<u>Virtual day – Training Prospective memory in</u> <u>older adults with virtual reality.</u>
10.45-11.05	Riccardo Domenicucci	Cognitive stimulation therapy for people with dementia and its collaborative-based adaptation: examining benefits in classical and Theory of Mind and metalinguistic outcomes.

09.45 - 11.15 – Individual differences in cognition

Aula Scarpa

CHAIR OF TH	E SESSION – Alessia Rosi	
09.45-10.05	Valgeir Thorvaldsson	Generational differences in cognitive terminal decline: A comparison of two population- based cohorts born 29-years apart.
10.05-10.25	Chiara Scarampi	The interplay of metacognition and cognitive reserve: pathways to preserving cognitive function.
10.25-10.45	Elena Carbone	«Open your mind» towards a healthy cognitive ageing: gauging the links between Openness, different life-stage dependent cognitive reserve proxies and cognition in adulthood and older age.
10.45-11.05	Gizem Hülür	The role of individual and environmental socio-economic resources for cognitive change in very old age.

15.00-16.30 – Individual differences in neural mechanisms

Aula Scarpa

CHAIR OF THE SESSION – Irene Ceccato

15.00-15.20	Zoya Mooraj	A functional future for the cognitive neuroscience of human aging.
15.20-15.40	Christiane Jockwitz	Prediction of individual cognitive test scores from brain and non-brain data across the adult lifespan.
15.40-16.00	Camilla Mendl-Heinisch	Prediction of individual cognitive test performance based on imaging and non- imaging data in older adults.
16.00-16.20	Natalia Zhukova	Reduced dynamic functional connectivity in higher ages: are older brains less adaptable?

ORAL TALKS – ABSTRACTS

Cognitive training

Are individual EEG connectome features more substantial than group effects in younger and older adults?

by Andrea Protzner¹ | Petia Kojouharova² | Boglárka Nagy² | Gwen van der Wijk³ | Orsolya Horváth², ⁴ | István Czigler² | Zsófia Anna Gaál²

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Economics, Budapest, Hungary

Recent connectomics research suggests that there is meaningful individual divergence from group-average connectivity patterns in deeply sampled datasets. MRI has dominated to date, but EEG offers a cost-effective alternative with high temporal resolution. Here, we use imaginary coherence to measure functional connectivity. We characterise the magnitude of individual differences in relation to between and within group differences that are commonly investigated (e.g., young vs old, cognitive training vs no training, task, and time effects). We collected EEG from 39younger (18-25yrs) and 40 older (60-75yrs) adults performing 180 minutes of task switching and transfer paradigms in two sessions. We calculated how much variance in functional connectivity was shared across all participants and sessions, within/across groups (young vs old, trained vs untrained), tasks, time, and individuals. Individual differences (40%) and common (53%) connectivity features contributed most to the explained variance, while group differences related to age (2.5%) and training (0.5%) made significant but small contributions. Overall, our work suggests that stable individually unique features of EEG connectomes are much larger than group effects and can provide complementary insights to MRI regarding individual differences in

brain. The functional significance of these unique features should be considered in future research.

Investigating the role of cognitive training in facilitating compensatory scaffolding in older adults: an EEG measurement approach.

by Ludmiła Zając-Lamparska¹ | Dariusz Zapała² | Emilia Zabielska-Mendyk² | Paweł Augustynowicz² ¹ Kazimierz Wielki University in Bydgoszcz, Poland ² The John Paul II Catholic University of Lublin, Poland

A comprehensive theoretical model that encompasses both decline and preservation phenomena in cognitive aging is the Scaffolding Theory of Aging and Cognition (STAC) and its revised version (STAC-R) by D. Park and P. Reuter-Lorenz. According to this model, scaffolding enhancement is achievable through various interventions.

The presented study investigated whether working memory training can induce compensatory scaffolding in older adults through increased prefrontal and parietal involvement.

The sample comprised 90 individuals, including 45 participants from the experimental group (22 older adults and 23 young adults) and 45 from the control group (21 older adults and 24 young adults). We assessed the effects of a 12-session working memory training on theta and alpha power measured in frontal-midline and central-parietal areas by EEG in older and young adults during the n-back task performance at three difficulty levels.

The results indicated changes in theta power but no significant alterations in alpha power. These changes were more pronounced in older than young adults and depended on the task difficulty level. Furthermore, these changes appeared to be more indicative of the retest learning effect and the participant's familiarity with the rules of the cognitive task rather than a reflection of the training effect.

Virtual day – Training prospective memory in older adults with virtual reality.

by Alexandra Hering¹ | Oscar Delgado Rued² | Maria Nygaard³ | Maryam Alimardani⁴ | Phillip Brown² | Eriko Fukuda² | Mercedes Almela⁵

¹ Department of Developmental Psychology, Tilburg University, NL

² Department of Cognitive Science and Artificial Intelligence, Tilburg University, NL

³ School of Psychology, University of Aberdeen, UK

⁴ Department of Computer Science, Vrije Universiteit Amsterdam, NL

⁵ Department of Cognitive Neuropsychology, Tilburg University, NL

Prospective memory (PM) refers to the ability to remember daily intentions at the appropriate moment. Studies aiming to improve PM in older adults showed only limited training efficiency and often lack transferability to everyday life. In this study, we present a new training environment based on 3D-Virtual Reality (VR) called Virtual Day. Virtual Day simulates an immersive everyday environment with typical daily activities. Healthy older adults (N = 90) will be assigned to one of three groups: 1) Virtual Day training group, receiving a PM training in the novel VR environment; 2) Conventional training group, receiving PM training using the computerized 2D-boardgame Virtual Week; and 3) No contact control group, receiving no training. All three groups will be assessed before and after the training on their PM performance using the Virtual Day and Virtual Week tasks and real-life PM tasks including a call-back task and an intention diary. Data collection is ongoing and first preliminary results will be presented. VR offers the controlled setting of

a laboratory study and allows to implement a complex, multisensory and realistic experience.

Thus, the study aims to advance cognitive training research by integrating a real-life experience in the lab.

Cognitive Stimulation Therapy for people with dementia and its collaborative-based adaptation: Examining benefits in classical and Theory of Mind and Metalinguistic outcomes.

by Riccardo Domenicucci^l | Dr. Elena Carbone^l | Dr. Enrico Sella^l | Prof. Carmen Belacchi² | Prof. Michela Sarlo² | Prof. Erika Borella^l

¹ Department of General Psychology, University of Padova

² Department of Communication Sciences, Humanities and International Studies, University of Urbino Carlo Bo

Promoting quality of life among people with dementia (PwD) is a public health priority. Cognitive Stimulation Therapy (CST) is among the psychosocial interventions for PwD with the strongest evidence of efficacy. This pilot study aims to examine the efficacy of an adaptation of the CST protocol based on collaborative activities (C-CST) compared with the Standard-CST (S-CST). Benefits in both traditional and novel outcomes, like Theory of Mind (ToM) and definitional competence of emotions, were also examined. Twenty-eight individuals with mild-to-moderate dementia (mean age: 87 ± 5.74) were recruited. Benefits global cognitive functioning (Mini-Mental State Examination), mood and in neuropsychiatric symptoms (Cornell Scale for Depression in Dementia, Neuropsychiatric Inventory), social and emotional loneliness (de Jong Gierveld Loneliness Scale), ToM affective (Reading the Mind in the Eyes Test), cognitive (Picture Sequencing Task)- and definitional competence of emotions (Definitional Competence Scale) were examined. Results from linear mixed model showed that both protocols alleviated social loneliness, maintained mood, and improved definitions of emotions, while only S-CST supported global cognitive functioning and cognitive ToM, and counteracted neuropsychiatric symptoms at post-intervention. These findings confirm the efficacy of the S-CST in supporting PwD' cognitive and behavioral functioning and highlight the potentialities of its collaborative adaptation in ameliorating socio-emotional outcomes.

Individual differences in cognition

Generational differences in cognitive terminal decline: A comparison of two population-based cohorts born 29-years apart.

by Valgeir Thorvaldsson Department of Psychology, University of Gothenburg, Sweden

The terminal decline (TD) hypothesis (Kleemeier, 1962) has received substantial support over the last two decades. Longitudinal studies demonstrate average onset of acceleration in cognitive decline 5 to 10 years prior to death and a significant increase in rate of decline after onset. In this study, we evaluated birth cohort differences in TD. We obtained data from two cohorts (H70), born in 1901-1902 (n=755) and 1930 (n=347), identified at age 70 from the same population and assessed on the same cognitive tests at ages 70, 75, 79,85, and 88. The 1901-02 cohort was further assessed at ages 90, 92,95,97, 99, and 100. Outcome was defined by composite of three tests (spatial ability, speed, reasoning), and dates of death were derived from population register. We fitted random change point model to the data. Findings revealed TD onset estimated at 5.17 years prior to death (95% HDI [5.68, 8.05]) in the 1901-02 cohort, with acceleration in rate of decline within the TD phase by a factor of 4.43. TD onset was delayed by 2.53 years [0.10, 5.68] in the 1930 cohort, with acceleration factor of 5.16 within the TD phase. Today's birth cohort experiences a shorter TD phase compared to earlier cohorts.

The interplay of metacognition and cognitive reserve: pathways to preserving cognitive function.

by Chiara Scarampi¹ | Sam Gilbert² | Andreas Ihle¹ | Matthias Kliegel¹ | ¹ University of Geneva ² University College London

Cognitive reserve explains variations in individual resilience to age-related cognitive decline and neuropathology. Yet, the mechanisms through which cognitive reserve supports cognitive health remain largely unexplored. This pre-registered study investigated metacognition—the capacity to evaluate and regulate one's cognitive processes—as a possible pathway through which cognitive reserve exerts its protective effects in aging. A diverse, age-stratified sample of 300 adults completed a delayed-intention task. On certain trials, participants could set reminders to complete specific delayed actions, enabling us to assess how effectively they balanced reliance on internal memory with the use of external aids. Prior to the task, participants also provided metacognitive judgments. Cognitive reserve was quantified through a composite measure encompassing educational attainment, occupational demands, and levels of leisure activity. The results shed light on the mediating role of metacognition—particularly the ability to implement effective strategies—in linking cognitive reserve to cognitive health. Theoretical and practical implications of the findings will be discussed.

"Open your mind" towards a healthy cognitive ageing: Gauging the links between Openness, different life-stage dependent cognitive reserve proxies and cognition in adulthood and older age.

by Elena Carbone¹ | Stephen Aichele² | Paolo Ghisletta³ | Erika Borella¹

¹ Department of General Psychology, University of Padova, Italy

² College of Health and Human Sciences, Colorado State University, USA

³ Faculty of Psychology and Educational Sciences, University of Geneva, Switzerland

The present study aimed at examining the associations between the Big Five Personality traits, different life-stage dependent socio-behavioral proxy measures of cognitive reserve (CR) and cognition in adulthood and older age. A sample of 156 community-dwelling adults (age range: 55-90) completed the Current and Retrospective Cognitive Reserve (2CR) survey, assessing CR proxy measures spanning socio-economic status, family engagement and engagement in leisure, social and religious/spiritual activity both currently (CRc; in later adulthood) and retrospectively (CRr; as recalled from younger adulthood), a Big Five questionnaire and measures of working memory, fluid ability and vocabulary. Structural regression analyses showed that Openness was the only personality trait positively associated with both global CRc and CRr, their leisure activity and social engagement dimensional factors as well as the retrospective socio-economic status dimension (i.e., educational attainment). A parallel mediation analysis showed an indirect effect of Openness on cognitive ability, mediated by CRr but not CRc. These results further highlight

how certain personality traits, and more consistently Openness, drive individuals to engage cognitively stimulating and active lifestyles across different life stages which, in turn, benefit cognitive performance, with implications towards the promotion, also from preventive purposes, of cognitive and brain health in adulthood and older age.

The role of individual and environmental socio-economic resources for cognitive change in very old age.

by Gizem Hülür¹ | Jaroslava Zimmermann² ¹ University of Bonn ² University of Cologne

This goal of this study was to examine the role of individual and environmental socioeconomic resources for cognitive aging in adults aged 80+, a rapidly growing demographic segment. We used data from 797 participants of the NRW80+ in 2017-2018 and 2019-2021, a survey of a population-based sample of very old individuals in North-Rhine Westphalia, the most populous federal state in Germany. Individual socio-economic resources included education, income, wealth, and occupational prestige, while environmental socio-economic resources were assessed at the municipality level and included indicators like population density, healthcare availability, and transportation access. Results showed that higher education and wealth were independently related to better baseline cognitive function. Individual socio-economic resources were unrelated to cognitive change over time. Environmental factors including greater population density, broadband availability, but also higher unemployment rates were related to better baseline cognitive function. Greater distance to highways, but also limited healthcare resources were associated with less decline. Our findings suggest that individual socio-economic resources continue to be relevant to cognitive function in very old age but are unrelated to short-term cognitive decline. There is also some evidence for associations of baseline cognitive function and cognitive change with environmental factors over and above individual socioeconomic resources.

Individual differences in neural mechanisms

A functional future for the cognitive neuroscience of human aging.

by Zoya Mooraj¹ | Alireza Salami^{2, 3, 4} | Karen L. Campbell⁵ | Martin J. Dahl^{1, 6, 7} | Julian Q. Kosciessa⁸ | Matthew R. Nassar^{9, 10} | Markus Werkle-Bergner¹ | Fergus I. M. Craik¹¹ | Ulman Lindenberger^{1, 6} | Ulrich Mayr¹² | M. Natasha Rajah^{13, 14} | Naftali Raz¹⁵ | Lars Nyberg^{2, 16, 17} | Douglas D. Garrett^{1, 6}

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- ⁴ Wallenberg Center for Molecular Medicine, Umeå University
- ⁵ Department of Psychology, Brock University
- ⁶ Max Planck UCL Centre for Computational Psychiatry and Ageing Research
- ⁷ Leonard Davis School of Gerontology, University of Southern California
- ⁸ Radboud University, Donders Institute for Brain, Cognition and Behaviour
- ⁹ Robert J. & Nancy D. Carney Institute for Brain Science, Brown University
- ¹⁰ Department of Neuroscience, Brown University
- ¹¹ Rotman Research Institute at Baycrest, Toronto
- ¹² Department of Psychology, University of Oregon
- ¹³ Department of Psychiatry, McGill University

¹⁴ Department of Psychology, Toronto Metropolitan University

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¹⁷ Department of Diagnostics and Intervention, Umeå University

A primary goal in the cognitive neuroscience of aging is to delineate precisely which brain changes underpin aging-related changes in cognition. However, the field has evolved such that ~90% of recent published research focuses on either brain structure or resting-state function (Mooraj et al., under review), neither of which involve imaging the aging brain during experimentally manipulated cognitive operations. Such approaches are therefore unlikely to provide as comprehensive an understanding of the neural bases of cognitive aging as functional neuroimaging accounts (ranging from EEG and fMRI, to dynamic PET and functional MRS), which allow for a sensitive and flexible interrogation of the brainin action by providing an online window into cognitive functioning. We thus emphasise the necessity and value of a functionally interrogated, multi-modally imaged, behaviour-first perspective on the cognitive neuroscience of aging.

Prediction of individual cognitive test scores from brain and non-brain data across the adult lifespan.

by Christiane Jockwitz^{l,2} | Camilla Mendl-Heinisch^{l,2} | Tatiana Miller^{l,2} | Paulo Dellani^{l,2} | Svenja Caspers^{l,2}

¹ Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, Jülich, Germany

² Institute for Anatomy I, Medical Faculty & University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Düsseldorf, Germany

Predicting cognitive decline in aging remains a challenging but important topic. Existing results are heterogeneous, potentially due to the non-linear nature of both, cognitive decline and the factors that influence it. We here aimed to systematically examine the predictability of cognitive abilities based on brain and non-brain data across five decades of the adult lifespan in the large German National Cohort (NAKO; N = 23,863; 25 to 75 years). Brain summary statistics (e.g. total grey matter), health (e.g. body-mass-index) and demographic (i.e. age, sex, education) data were used to predict four cognitive scores using a machine learning (ML; repeated nested cross-validation; four regression algorithms) approach.

Current results emphasize that demographics tend to outperform brain and health factors in predicting cognitive abilities in a large sample spanning the whole adulthood, with better predictability for episodic memory and interference compared to verbal fluency and working memory. Contrary to the hypothesis of a worse prediction at older ages, prediction appeared to be similarly low in each decade. Hence, sample size seems to matter even more than sample homogeneity. Including a wide age range for reaching large sample sizes, though, could come at the cost of predicting a hidden age effect.

Prediction of individual cognitive test performance based on imaging and non-imaging data in older adults.

by Camilla Mendl-Heinisch^{l,2} | Nora Bittner^{l,2} | Tatiana Miller^{l,2} | Paulo Dellani^{l,2} | Svenja Caspers^{l,2} | Christiane Jockwitz^{l,2}

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Early detection of cognitive decline gains relevance in normal aging given its impact on the quality of life of older adults. While using brain imaging data alone can be challenging, there is an opportunity to use health-related and demographic data as biomarker as these are easily accessible and have already been shown to be associated with cognitive dysfunction. Thus, using machine learning (ML) we examined the practicality of 1) imaging, 2) health related and 3) demographic data, in the prediction of cognitive functioning (16 cognitive test scores) in 494 older adults (67 + /-7 years) from 1000BRAINS. Prediction performance was obtained for each modality and its combinations using cross-validation and four algorithms.

Predictability differences emerged across modalities and cognitive functions. In terms of individual tests, vocabulary, executive and episodic memory functions were moderately predicted from demographic and partially from brain data; working memory showed low predictability across modalities.

Overall, health-related data showed limited predictability across cognitive functions despite known associations between cardiovascular health and cognitive decline. Strikingly, demographic variables outperformed health and imaging data highlighting their impact on predictions of cognition. Finally, we observed higher predictability of executive and episodic memory functions, which are important for the prognosis of neurodegenerative diseases.

Reduced dynamic functional connectivity in higher ages: are older brains less adaptable?

by Natalia Zhukova^{1,2} | Camilla Mendl-Heinisch^{1,2} | Chrictiane Jockwitz^{1,2} | Svenja Caspers^{1,2} | ¹ Institute for Anatomy I, Medical Faculty & University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Düsseldorf, Germany ² Institute of Neuroscience and Medicine (INM-1), Research Center Jülich, Jülich, Germany

Static functional connectivity (FC) approaches, assuming constant interactions between brain regions, revealed important insights into the aging process. Nevertheless, recent research has indicated that a more sophisticated understanding of the time-varying nature of brain function may prove particularly useful in identifying biomarkers for healthy aging. The current study therefore investigated dynamic FC (dFC) in a large group of older adults (1000BRAINS; n=817; 373 females; 55-85 years; MAge=67±7). Time-varying correlation matrices and dFC states were extracted from resting-state fMRI using sliding windows and clustering. We examined both, temporal features of dFC states, e.g. duration and transitions, together with age-related differences in network architecture (17 networks Schaefer parcellation). We found four distinct dFC states, of which two showed agesensitive patterns. The first was distinguished by highly connected networks and became less prevalent with age. In contrast, the second state was characterized by reduced network connectivity, becoming more prevalent with age. Together with a decline in transition between states, the results underscore an age-related reduction in overall network communication and a reduced capacity for functional adaptation. The findings challenge the conventional understanding of brain network interactions by emphasizing the dynamic adaptability of the brain in explaining variations in cognitive functioning.

SYMPOSIA – OVERVIEW

Aula Magna

09.45-11.15 – Pragmatics		
	Pragmatics and	communication in Ageing.
Chair	Valentina Bambini	
Speakers	Irene Ceccato	Pragmatic competence and aging: Insights into cognitive and socio-cognitive correlates.
	Madeleine Long	Prosocial speech acts: links to pragmatics and aging.
	Chiara Barattieri di San Pietro	Pragmatics affects wellbeing in senior citizens: an ecological momentary assessment study.
	Francesca Bosco	Specific efficacy of the advanced cognitive pragmatic treatment to improve communicative ability in healthy aging.

15.00-16.30 - Subjective views of Aging

Subjective views of aging: Insights on associations with cognitive performance and the experience of dementia caregiving.

Citali	Enneo Sena	
Speakers	Enrico Sella	<u>How subjective views of aging shape</u> cognitive functioning in adulthood and older age.
	Serena Sabatini	Associations between concurrent and twelve- year change in cognitive functioning with attitudes to aging in very old individuals.
	Fiona S. Rupprecht	Subjective age and working memory in daily life.
	Beth Fairfield	Personal views of aging among informal caregivers of people with dementia and non- caregivers: the role of individual characteristics and caregiving-related burden.

Symposia – Abstracts

Pragmatics

Pragmatics and communication in ageing.

by Irene Ceccato¹ | Madaleine Long² | Chiara Barattieri di San Pietro³ | Francesca Bosco⁴ Chair: Valentina Bambini³

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Effective communication is at the heart of social interactions. However, little is known about how the pragmatic skills that support communication evolve along the lifespan in response to age-related cognitive, affective, and social modifications. By describing the pragmatic profile of older adults via innovative assessment approaches, including ecological ones, their use of prosocial language, and intervention methods to improve communicative skills, this symposium aims to settle a novel field of investigation, focused on pragmatics in older adulthood and its role in supporting well-being, with possible applications in both clinical and community settings.

TALK 1: PRAGMATIC COMPETENCE AND AGING: INSIGHTS INTO COGNITIVE AND SOCIO-COGNITIVE CORRELATES.

by Irene Ceccato¹

Authors: Irene Ceccato¹ | *Elena Cavallini*² | *Luca Bischetti*³ | *Eleonora Marocchini*⁴ | *Veronica Mangiaterra*³ | *Serena Lecce*² | *Valentina Bambini*³

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The study of pragmatic competence has been largely neglected within the aging literature, despite its critical role in social functioning. Here we present a research program including several studies that we conducted on the topic of the complex interplay between aging, pragmatics, and both cognitive and socio-cognitive processes. With respect to pragmatic comprehension, particularly figurative language, our studies showed that aging adversely affects the comprehension of both humor and metaphor. Moreover, evidence indicated that theory of mind (ToM) differentially contributes to figurative language comprehension depending on the specific demands of the pragmatic task. With respect to pragmatic production, our investigation focused on off-topic verbosity (OTV), defined as extended speech lacking in focus and coherence. Our studies confirmed the higher prevalence of OTV among older adults relative to their younger counterparts. Furthermore, we developed a novel instrument to assess OTV comprehensively, incorporating both frequency and severity during semi-structured autobiographical interviews. Analyses of cognitive and socio-cognitive correlates of OTV across young-old and old-old cohorts revealed both convergences and divergences between these aging phases, underscoring the selective contributions of processing speed, inhibitory control, and theory of mind.

Collectively, these findings affirm the interdependence of pragmatic competence and social cognition, while also advancing a more nuanced understanding of their relationship.

TALK 2: PROSOCIAL SPEECH ACTS: LINKS TO PRAGMATICS AND AGING.

By Madeleine Long Authors: Madeleine Long and Sarah MacPherson School of Philosophy, Psychology and Language Sciences, University of Edinburgh

Prosocial speech acts (i.e., those in which the aim is to protect the listener's feelings/selfimage) are ubiquitous in everyday speech, enabling people to build and maintain relationships. This study investigated the use of prosocial speech acts over the adult lifespan, revealing that prosocial linguistic behavior is influenced by a combination of differences in audience design and communicative styles at different ages. Collectively, these findings highlight the importance of situating prosocial speech acts within the pragmatics and aging literature, allowing us to uncover the factors modulating prosocial linguistic behavior at different developmental stages.

TALK 3: PRAGMATICS AFFECTS WELLBEING IN SENIOR CITIZENS: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY.

by Chiara Barattieri di San Pietro¹ Authors: Chiara Barattieri di San Pietro¹ | Valentina Bambini¹ | Alessia Rosi² | Lara Fracassi² | Serena Lecce² | Elena Cavallini² ¹ Laboratory of Neurolinguistics and Experimental Pragmatics (NEP), University School for Advanced Studies IUSS, Pavia ² Department of Brain and Behavioral Sciences, University of Pavia

Pragmatic abilities are crucial to regulate social interactions, but with age their decline can pose a risk to maintaining social engagement. Traditional in-lab, paper-and-pencil, and retrospective questionnaires can introduce memory biases and, most importantly, miss momentary variations in use. We assessed age differences in the effects of both expressive (respecting the topic of the conversation and expressing concisely) and expressive (following the thread of the discourse and understand jokes or idioms) pragmatic abilities on everyday wellbeing (happiness and life satisfaction) via Ecological Momentary Assessment (EMA). The analysis of the answers submitted by 82 young and 80 senior participants to both open and closed questions, collected for seven days, five times a day, indicate that the pragmatic success in social interactions is a strong predictor of wellbeing irrespective of age, and that in particular seniors' quality of life is significantly and positively modulated by the ability to follow the thread of the discourse. This is the first study that applies the EMA methodology to the study of pragmatics and social communication in everyday settings.

TALK 4: SPECIFIC EFFICACY OF THE ADVANCED COGNITIVE PRAGMATIC TREATMENT TO IMPROVE COMMUNICATIVE ABILITY IN HEALTHY AGING.

by Francesca Bosco Author: Francesca Bosco GIPSI Research Group, Department of Psychology, University of Turin, Turin, Italy

The aim of the study is to investigate the efficacy of a novel cognitive training, the Advanced-CPT, in improving pragmatics ability in aging healthy. We expect taking part to the Advanced-CTP leads to pragmatic improvements, not detectable after unstructured social activities, i.e. control group sessions. We also expect the Advanced-CPT to determine

a specific effect on pragmatic ability, rather than a generalized improvement involving also cognitive and Theory of Mind skills.

Subjective views of aging

Subjective views of aging: insights on associations with cognitive performance and the experience of dementia caregiving.

*by Enrico Sella*¹ | *Serena Sabatini*^{2, 3} | *Fiona S. Rupprech*⁴ | *Beth Fairfield*⁵ *Chair: Enrico Sella*¹

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This symposium presents the macro-construct of Subjective Views of Aging (VoA) and examines the impacts of various VoA concepts on cognition in older adults, as well as individual differences in VoA among dementia caregivers. The first presentation introduces a new instrument assessing views of cognitive aging and discusses relationships between generalized and personal VoA and cognitive performance. The second presentation analyzes cross-sectional and longitudinal data on aging perceptions and executive function. The third presentation examines daily fluctuations in subjective age and working memory. The fourth presentation investigates how caring for a relative with dementia influences informal caregivers' awareness of aging.

TALK 1: HOW SUBJECTIVE VIEWS OF AGING SHAPE COGNITIVE FUNCTIONING IN ADULTHOOD AND OLDER AGE.

by Enrico Sella

Authors: Enrico Sella¹ | *Elena Carbone¹* | *Riccardo Domenicucci¹* | *Diletta Signori¹* | *Maria Letizia Tanturri²* | *Antonio Paoli³* | *Erika Borella¹*

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Subjective views of aging (VoA) encompass perceptions, attitudes, and beliefs about agerelated changes. Despite growing evidence, there is no consensus on reliable tools for assessing VoA, and little is known about how subjective views on cognitive aging influence cognitive functioning. Starting from a systematic review that identified 77 studies and 26 self-report instruments assessing VoA concepts, but none focused on views of age-related cognitive changes, this study presented the new Views of Cognitive Aging (VoCA) questionnaire, and examined its association with cognitive functioning in typically-aging adults and older adults. A sample of 600 participants (aged 40-90 years) completed VoA measures—felt age, Attitudes Toward Own Aging, Awareness of Age-Related Change, Non-Essentialist Beliefs about Aging—, the VoCA questionnaire, and cognitive tasks -digit span backward, D2 test, and Pattern Comparison. Results showed that higher perceived control over cognitive changes (VoCA) was associated with better working memory, feeling younger (lower felt age) with better attention, whereas negative attitudes toward own aging were associated with reduced attention and slower processing speed. These findings underscore the importance of assessing VoA, particularly cognitive aspects, to better understand how perceptions of aging influence cognitive performance across adulthood and older age.

TALK 2: ASSOCIATIONS BETWEEN CONCURRENT AND TWELVE-YEAR CHANGE IN COGNITIVE FUNCTIONING WITH ATTITUDES TO AGING IN VERY OLD INDIVIDUALS.

by Serena Sabatini

Authors: Serena Sabatini^{1,2} | *Katya Numbers*³ | *Nicole Kochan*³ | *Perminder S. Sachdev*^{3,4} | *Henry Brodaty*³

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This study investigated the cross-sectional associations between cognitive domains and global cognition and self-perceptions of aging. It also investigated whether twelve-year change in the same cognitive domains and global cognition is associated with selfperceptions of aging. Participants were 103 individuals from the Australian Memory and Ageing Study with twelve-year follow-up mean age of 87.43 years (60.2% women). Cognitive domains investigated were attention processing speed, language, executive functions, visuospatial abilities, memory, and verbal memory. Self-perceptions of aging were assessed with the Laidlaw' Attitudes to Aging Questionnaire assessing psychological growth, psychosocial loss, and physical change. Cross-sectionally, better executive functions (B = 0.75; p-value = .010); visuospatial abilities (B = 0.59; p-value = .045); memory (B= 1.00; p-value= .009); verbal memory (B= 1.01; p-value= .006); and global cognition (B=0.81; p-value=.046) showed small associations with greater positive physical change, but not with psychological growth nor with psychosocial loss. Smaller twelve-year decline in executive functions (B= -0.78; p= .020) and in global cognition (B= -1.06; p= .035) were associated with greater physical change. Whereas cross-sectionally better scores on several cognitive tasks may indicate more positively perceived physical changes, only less decline in executive functions may be related to more positively perceived physical changes.

TALK 3: SUBJECTIVE AGE AND WORKING MEMORY IN DAILY LIFE.

by Fiona S. Rupprecht

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Previous research indicates that how individuals perceive their own aging (as well as aging in general) can influence cognitive functioning in the long-term. It is however poorly understood whether and how subjective aging and cognitive functioning relate to each other in the more immediate time frames of daily life. To address this, we investigated micro-longitudinal reciprocal relationships between subjective age (i.e., the age one feels at a given moment) and working memory (assessed via a numerical updating task). Data came from an ambulatory assessment study which sampled both variables six times a day for seven consecutive days. Participants were 117 young-old (66–69 years old) and 40 old-old adults (84–90 years old). Dynamic structural equation modeling showed that moments of daily life characterized by more extreme subjective ages—both the feeling of being particularly young, and the feeling of being particularly old—were followed by occasions with worse working memory. A preoccupation with age could potentially prime negative age stereotypes or bind cognitive resources otherwise and result in worse cognitive functioning in the short-term. The discussion will focus on possible explanations behind this effect as well as potential implications and long-term consequences.

TALK 4: PERSONAL VIEWS OF AGING AMONG INFORMAL CAREGIVERS OF PEOPLE WITH DEMENTIA AND NON-CAREGIVERS: THE ROLE OF INDIVIDUAL CHARACTERISTICS AND CAREGIVING-RELATED BURDEN.

By Beth Fairfield

Authors: Beth Fairfield¹ | Caterina Padulo¹ | Elena Carbone² | Serena Sabatini³ | Federica Piras⁴ | Enrico Sella² | Salvatore Bazzano⁵ | Flavio Busonera⁵ | Lucia Borgia⁶ | Linda Clare⁷ | Erika Borella² ¹ Department of Humanities, Federico II University of Naples, Naples, Italy

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Caring for older relatives with dementia may influence an individuals' representations, experiences and expectations regarding their own aging process. This study aimed to examine whether informal caregivers of people with dementia and non-caregiving peers differ in their personal views of aging (VoA), assessed in terms of felt age (FA) and awareness of age-related gains and losses (AARC), and to ascertain their relationship with caregiving-related burden and distress and sociodemographic and health-related factors. Results showed that although no differences emerged between dementia caregivers and non-caregivers' personal VoA, sociodemographic and health-related factors influence personal VoA differently, depending on whether individuals care for a person with dementia or not. Moreover, caregiver burden contributed to explaining awareness of agerelated losses among dementia caregivers. A mediation model revealed a direct effect of caregiver burden, social status and self-rated health on caregivers' awareness of age-related losses, and an indirect effect of mood mediated by caregiver burden on caregivers' awareness of age-related losses. These findings confirm the interplay between VoA, sociodemographic and health-related factors in adulthood and older age and suggest that strains derived from caring for a relative with dementia influence dementia caregivers' personal VoA, particularly where their awareness of age-related losses is concerned.

POSTER SESSION 2 – OVERVIEW

Cortile delle Magnolie

11.15 – 12.45 – Poster session 2

1	Geraldine Rodríguez-Nieto	Network neurochemical interactions during cognitive flexibility in young and older adults.
2	Laura Favilli	Aging and mind wandering: development of a <u>new performance-free task to assess</u> spontaneous thoughts.
3	Ilaria Corbo	The predictive role of cognitive reserve in executive functioning.
4	Matthew Johnston	The interplay between cognitive control and statistical learning processes in older adults.
5	Petia Kojouharova	Event-related potential evidence of flexible adaptation of visual search strategies across age groups.
6	Daniel Schneider	Task interruption effects on working memory: younger but not older adults benefit from temporal flexibility in task resumption.
7	Zoya Mooraj	Exploring the effects of selective dropout in longitudinal fMRI studies.
8	Mingxian Zhang	Leveraging lifestyle clusters and multimodal brain features to enhance cognitive prediction models in healthy older adults.
9	Tatiana Miller	White matter lesions spatial distribution patterns related to cardiovascular aging follow arterial supply territories.
10	Benedict Caspari	Microarchitectural differences between white matter lesions and normal-appearing white matter across arterial territories: insights from neurite orientation dispersion and density imaging.
11	Nora Bittner	Impact of methodological choices when reconstructing specific streamline fiber tracts.
12	Sandali Liyanagoonawardena	Individual differences in healthy aging in vision.
13	Caterina Artuso	Taxonomic and thematic semantic knowledge as predictors of reading comprehension in aging.

14	Katharina Peitz	The influence of bilingualism on gray matter volume within subregions of the hippocampal formation.
15	Zeinab Khazem	Future thinking across aging: a cross-cultural perspective.
16	Laetitia Bruno	Future time perspective and sense of finitude: effects on memory and emotional regulation in aging.
17	Marvin Dophemont	<u>Associative memory in older adults: predictors of change across six years.</u>
18	Luisa Knopf	Examining the effect of picture familiarity on the age-related associative memory deficit.
19	Tom Nyhoff	<u>Refining calculations of the ribot temporal</u> gradient: optimising utilisation of the famous faces test.
20	Burcu Demiray	Memories of age discrimination in relation to older adults' well-being.
21	Maria Arberg Nygaard	The role of social factors on intrinsic motivation in prospective memory amongst older adults.
22	Charlotte D.M.A. Pas	Spontaneous prospective memory: do younger and older adults differ in noticing an unexpected prospective memory cue?
23	Emilie Joly-Burra	Prospective memory as a key predictor of everyday functioning in middle and older adulthood in the Canadian Longitudinal Study on aging.
24	Ina Demetriou	<u>12-year, longitudinal changes in cognition in an adult lifespan sample.</u>
25	Orsolya Horváth	The impact of hormonal changes on cognitive function in menopause
26	Alexa C. Allan	Neighborhood quality moderates relationship between sleep duration and cognitive performance

POSTER SESSION 2 – ABSTRACTS

1. Network neurochemical interactions during cognitive flexibility in young and older adults.

by Geraldine Rodríguez-Nieto¹ | Stephan Swinnen¹ | David Álvarez-Anacona² ¹ KU Leuven ² Universidad Nacional de Colombia

Aging is accompanied by important changes in brain metabolism. Some studies have brought light into changes regarding metabolic levels. However, the relationship among different metabolites during cognitive performance and age associated changes had remained unexplored. In this Magnetic Resonance Spectroscopy study (80 participants), we investigated the relationship among glutamate-glutamine complex (Glx), y-aminobutyric acid (GABA+), glutathione (GSH), N-acetylaspartate (NAA), creatine (Cr) and choline (Cho) in two brain regions relevant to cognitive flexibility, namely the inferior frontal and the inferior parietal cortices. The levels of Cho and Cr in both regions were correlated regardless of the state, whereas GSH levels in both regions were only related during flexible cognitive performance. Moreover, NAA levels difference between the two states (baseline and task) in both regions were related, suggesting its role in a task-dependent physiological mechanism involving both regions. Regarding the relationship among different metabolites within each region, we observed age-related (and region dependent) differences in the association of GSH -an important antioxidant- with other metabolites. The use of network analyses reveals changes in the neurometabolic dynamics associated to cognitive performance during aging and supports a deeper understanding of the structural and physiological properties of metabolites and age-related changes.

2. Aging and mind wandering: development of a new performance-free task to assess spontaneous thoughts.

by Laura Favilli¹ | Carlo Chiorri² | Viola Tarricone¹ | Manila Vannucci¹

¹ Department of NEUROFARBA-Section of Psychology, University of Florence, Italy

² Department of Educational Sciences, University of Genoa, Italy

Mind wandering (MW) refers to a spontaneous shift of attention from a primary task toward internally generated thoughts. Research on MW in aging has revealed some inconsistencies, likely due to procedural limitations. Specifically, task difficulty and concerns about the ongoing task have been associated with reduced MW in older adults, disproportionately affecting their spontaneous thoughts. To overcome these limitations, we developed a new, ecological visuomotor activity with verbal cues, designed as a "cool-down activity" that required the manipulation of a soft ball without performance assessment, and compared it to a modified version of the same task with performance assessment. To explore age-related differences, sixty young and sixty older adults completed these tasks in a 2x2 between subjects' design. Results showed that the new, performance-free task was more effective in inducing MW in both groups: without performance assessment, young and older adults reported a higher amount of MW, and their spontaneous thoughts were more likely to be triggered by external cues compared to the performance task. Additionally, participants in the non-performance condition were less likely to report task-related interferences. Overall, these findings suggest that a performance-free task is a promising avenue to enhance the study of mind wandering across age groups.

3. The predictive role of cognitive reserve in executive functioning.

by Ilaria Corbo | Giuseppe Forte | Francesca Favieri | Maria Casagrande | Department of Dynamic and Clinical Psychology, and Health Studies, "Sapienza" University of Rome, Rome, Italy

Cognitive reserve (CR) is the ability to compensate the age-related decline. Different studies have examined the role of CR in aging, from the perspective of protection against pathological aging. The purpose of this study is to examine how CR (schooling, working and leisure time) differs by age and how this could predict good executive functioning. A total of 318 participants (62 ± 7.8 years) were selected and divided by age. After anamnestic data collection, participants were interviewed to assess CR (Cognitive Reserve Index, CRI); then working memory (WM), phonemic fluency (PF), cognitive flexibility (TMT B and B-A) and fluid intelligence (RSPM) were assessed. Regression analyses revealed that TMT B (R2= 0.18; p= <0.001) was predicted by age, schooling and working; TMT B-A (R2= 0.14; p= <0.001) was predicted by age, schooling and working; PF (R2= 0.20; p= <0.001) was predicted by age, schooling and working; TMT B-A (R2= 0.14; p= <0.001) was predicted by age, schooling and working; TMT B-A (R2= 0.101) was predicted by age, schooling and working; TMT B-A (R2= 0.101) was predicted by age, schooling and working; TMT B-A (R2= 0.101) was predicted by age, schooling and working; DF (R2= 0.20); p= <0.001) was predicted by age, schooling and working; DF (R2= 0.001) was predicted by age and schooling; and RSPM (R2= 0.17; p= <0.001) was predicted by age, schooling and leisure time. Different predictive patterns may be observed in adulthood and aging. These findings could be useful for interventions to improve CR across the lifespan to strengthen executive functions crucial for daily independence.

4. The interplay between cognitive control and statistical learning processes in older adults.

by Matthew Johnston | Kelly Wolfe University of Edinburgh Heriot-Watt University

As higher-order executive function processes typically decline in healthy ageing, other cognitive abilities may play compensatory roles. One such process is statistical learning: the ability to track environmental patterns (e.g., learning when certain sounds go together in speech). Just as it has been proposed that immature top-down guidance allows infants to more efficiently learn regularities, older adults may similarly possess enhanced statistical learning in older adulthood is scarce and studies typically use forced-choice measures, which are problematic due to their reliance on long-term memory.

In two studies, current project investigates statistical learning in older adults, using a novel sorting task that captures differences in reaction time for statistically predictable and unpredictable stimuli. Study 1 involves the validation of the novel task with mixed-age participants (N = 60) on Prolific. Study 2 compares performance of 50 younger adults (ages 18-35) and 50 older adults (65 and older) on three executive function and two statistical learning tasks (including the novel sorting task). Data collection is ongoing and expected to be completed before May 2025. This project marks an important step to understanding how statistical learning functions alongside top-down processes in older adults.

5. Event-related potential evidence of flexible adaptation of visual search strategies across age groups.

by Petia Kojouharova¹ | Petra Csizmadia¹ | Boglárka Nagy^{1, 2} | István Czigler¹ | Zsófia Anna Gaál¹ ¹ Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary

² Department of Cognitive Science, Faculty of Natural Sciences, Budapest University of Technology and Economics, Budapest, Hungary

Decreased inhibitory control in older adults may result in greater processing of taskirrelevant stimuli. In visual search tasks this could affect both performance and search strategies. We explored age-related differences as reflected in the event-related potential components related to attention allocation (N2pc) and distractor suppression (P_D).

Twenty younger (18–30 years) and 21 older adults (60–75 years) performed visual search tasks while their EEG was recorded. When the search array contained one target and one distractor, the only difference was a longer N2pc latency in older adults. In the next task, in a training phase the participants performed singleton ("find the unique stimulus among homogeneous distractors") and feature ("find the circle among heterogeneous distractors") search in separate blocks on arrays containing six stimuli with a colour pop-out distractor in half of the trials. In the test phase they searched for a circle among homogeneous or heterogeneous distractors. Our results showed a difference between the two search modes only in N2pc amplitude in both phases. This effect was not moderated by age group. These findings suggest that both younger and older adults flexibly adapt their strategies and implicitly select the most effective approach for the given array.

6. Task interruption effects on working memory: Younger but not older adults benefit from temporal flexibility in task resumption.

by Daniel Schneider | Soner Ülkü | Edmund Wascher | Stephan Getzmann Leibniz Research Centre for Working Environment and Human Factors

Interruptions challenge cognitive functioning, affecting task performance and psychological well-being. This study explores age-related differences in managing interruptions during a visual working memory task. Younger adults (18–30 years) and older adults (55–70 years) were asked to store the orientation of two bar stimuli and later report one orientation based

on a retrospective cue. Interruptions occurred via arithmetic tasks, and resumption phases between the working memory task and the interrupting task were either short, long (additional 1000 ms), or self-determined. Interruptions consistently impaired task performance. Furthermore, younger adults benefited from self-paced resumption. EEG data revealed that additional resumption time enhanced beta suppression, aiding task disengagement and attentional refocusing. Flexible resumption further amplified oscillatory alpha and beta suppression only in younger adults, correlating with better task performance. These findings suggest that the opportunity for self-paced task resumption may facilitate more efficient cognitive processing specifically in younger adults, highlighting the complex interplay between age, interruption management, and working memory dynamics. This underscores the significant role of age in cognitive control, highlighting how the ability to adaptively manage interruptions diminishes with advancing age.

7. Exploring the effects of selective dropout in longitudinal fMRI studies.

by Zoya Mooraj¹ | Micael Andersson^{2, 3} | Anders Lundquist^{2, 4} | Lars Nyberg^{2, 3, 5}

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³ Department of Medical and Translational Biology, Umeå University

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⁵ Department of Diagnostics and Intervention, Umeå University

Longitudinal studies are essential for understanding brain and behavioral changes in aging, but participant dropout remains a significant complication. Instead of being missing at random, dropouts may be more likely to exhibit lower function or greater declines in outcomes of interest. Furthermore, while task-fMRI activation may be sensitive to dropout effects, only baseline neural activation differences in two-timepoint longitudinal studies have been assessed; additional timepoints can disentangle whether dropout is selective to level or change. Using fMRI data from 181 older adults, we examined differences in working-memory activation between those who dropped out and those who remained over a 10-year period. Dropouts showed greater frontal activation at baseline alongside lower performance across n-back conditions (1/2/3-back), indicating greater neural resource requirement. Additionally, despite overall declines in ACC activation between timepoints 1 and 2, disaggregating slopes based on dropout status at timepoint 3 uncovered increasing activation over time for dropouts on the less cognitively-demanding 1-back condition. These results indicate that restricting analyses to subjects with complete data across timepoints can lead to biased estimates of levels and directions of change of functional brain activity in aging, resulting in trends of diverging or lower functioning (e.g. increased frontal recruitment) to be missed.

8. Leveraging lifestyle clusters and multimodal brain features to enhance cognitive prediction models in healthy older adults.

by Mingxian Zhang^{1,2} | Nora Bittner^{1,2} | Camilla Mendl-Heinisch^{1,2} | Tatiana Miller^{1,2} | Susanne Moebus³ | Nico Dragano⁴ | Svenja Caspers^{1,2}

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Developing neuroimaging markers for normal cognitive aging is challenging due to variability in the brain and behavior among older adults, complicating the identification of predictors. However, modifiable lifestyle factors may help link underlying group differences in brain structure and function. Examining brain differences across distinct lifestyle groups may better identify informative features for predicting cognitive performance rather than relying solely on data-driven methods. This study explored whether lifestyle-related brain features could predict cognitive function in healthy older adults at baseline and after ~4 years, using multimodal MRI data from 563 participants of the 1000BRAINS cohort. We performed KModes clustering analysis on eight lifestyle factors to identify four distinct lifestyle groups and conducted univariate analyses to find significant between-group brain differences. These differences were used in a lifestyle-related model for machine learning, compared to data-driven models for predicting 13 cognitive tests. The lifestyle-related brain
model better predicted visual and episodic memory than data-driven models but showed limited generalization. Correlations between predicted and actual cognitive scores were significant at both baseline and follow-up. This study highlights the potential for integrating lifestyle information as a form of feature selection to help improve predictive models of cognitive performance during aging, pending further external validation.

9. White Matter Lesions spatial distribution patterns related to cardiovascular aging follow arterial supply territories.

by Tatiana Miller¹ | Nora Bittner¹ | Paulo Dellani² | Julian Quabs¹ | Svenja Caspers¹ | ¹ Institute for Anatomy I, Medical Faculty & University Hospital Düsseldorf, Heinrich Heine University, Düsseldorf, Germany ² Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, 42425 Jülich, Germany

White matter lesions (WML) in brain MRI scans are common in older adults and are linked to cognitive, mood, and motor disorders, as well as increased risks of dementia and stroke. These lesions are influenced by lifestyle and cardiovascular factors. To explore the relationship between cardiovascular health and WML spatial distribution, we analysed the similarity between participants using k-means clustering, based on WML center location, WML burden, and cardiovascular health status, in two population-based cohorts: 1000BRAINS (n=1,040, ages 18-85) and NAKO (n=27,559, ages 19-74). Cardiovascular health status was summarized using a 'cardiovascular age' score, which included age, sex, blood pressure, hypertension medication, smoking status, diabetes diagnosis, and cholesterol levels. We mapped the affected brain areas on the Digital 3D Brain MRI Arterial Territories Atlas and tested each cluster's mean WML distribution, surpassing 95% bootstrap confidence.

Our findings revealed five distinct WML spatial distribution patterns in each cohort, four of which were common across both. These patterns highlighted specific arterial territories with varying degrees of WML presence, providing evidence that WML spatial distributions are influenced by cardiovascular aging. Additionally, the medial lenticulostriate territory emerged as the first arterial region affected in normal aging.

10. Microarchitectural differences between white matter lesions and normalappearing white matter across arterial territories: Insights from Neurite Orientation Dispersion and Density Imaging.

by Benedict Caspari^{1,2} | Nora Bittner^{1,2} | Tatiana Miller^{1,2} | Svenja Caspers^{1,2} ¹ Institute for Anatomy I, Medical Faculty & University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Düsseldorf, Germany. ² Institute of Neuroscience and Medicine (INM-1), Research Centre Jülich, Jülich, Germany.

White Matter Lesions (WML) are linked to aging and vascular risk factors, while their microstructural mechanisms remain largely unclear. Using Neurite Orientation Dispersion and Density Imaging (NODDI), we investigated microarchitectural properties in WML in 915 participants (47% female, ages 18-85) from the population-based 1000BRAINS study. Microstructural properties, i.e. FA, extracellular volume fraction (ECVF), neurite density (ICVF) and dispersion (ODI) were derived from T1- and diffusion-weighted MRI for WML and normal-appearing white matter (NAWM). Within-person differences between WML and NAWM were calculated for each property and related to age, cardiovascular risk (e.g., blood pressure), and vascular supply.

Older age is associated with increased ECVF and ODI differences, but smaller ICVF differences. Mostly similar patterns were found for higher cardiovascular risk. In contrast to expectations, FA differences decreased with age.

Compared to NAWM, WML show an increased ECVF in anterior-supplied, while ICVF in medial-supplied and ODI in posterior-supplied cerebral artery regions decrease.

Together, our data indicate a non-uniform distribution of microstructural changes in WML across vascular territories, with additional variation linked to cardiovascular risk and age. Overall, the data suggest a greater reduction in neurite density in WML compared to NAWM in relation to older age.

11. Impact of methodological choices when reconstructing specific streamline fiber tracts.

by Nora Bittner^{1,2} | Medina Serifi^{1,2} | Paulo Dellani^{1,2} | Svenja Caspers^{1,2} | ¹ Institute for Anatomy I, Medical Faculty & University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Düsseldorf, Germany.

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Diffusion imaging enables the study of specific fiber tracts with different reconstruction options. Selecting tracts from a whole-brain connectome with a fixed streamline number seems to be recommended. However, the biological validity of a fixed number across individuals, especially in the context of age-related structural connectivity (SC) differences, is uncertain. This suggests alternative approaches for reconstruction like regional seeding.

For 1009 participants (553 females, 18 - 85 years) of the population-based 1000BRAINS cohort we exemplary reconstructed the Corpus Callosum with probabilistic tractography. First, we selected specific streamlines from an a-priori built whole-brain connectome with 10Mio streamlines. Second, we directly seeded (5000 seeds) streamlines in each voxel of the CC's mid-sagittal.

When comparing whether both approaches produce similar age-SC associations regarding explained variance, whole-brain based selection showed pronounced age-related SC differences, especially in anterior CC segments (< 27.1%). Direct seeding had a similar focus but showed generally smaller differences (<5.4%) and anatomically much more specific fiber trajectories. Agreement between approaches improved when using sift2 streamline weights instead of absolute streamline counts. Our data hence suggests an impact of the reconstruction approach on the strength of associations between SC and biological effects, here shown for age, with a possible overestimation by whole-brain based selection.

12. Individual differences in healthy aging in vision.

by Sandali Nisansa Liyanagoonawardena | Simona Garobbio | Michael Herzog EPFL

Representative tests are essential in all empirical sciences. For instance, good visual acuity, measured with eye doctors' Snellen E test, is assumed to predict good acuity when other visual acuity tests are used. A test is useless if performance in a test does not correlate with the performance of similar tests.

Surprisingly weak correlations are found in vision research on healthy aging. For example, we found that older adults performed worse than young adults in a battery of visual tests and illusions. However, within each population, performance in the various tests was largely

uncorrelated, despite good test re-test reliability. In other words, poor performance in one test does not indicate poor performance in a similar test.

Hence, tests are less representative than often expected, or the intra-individual variability is significantly higher than previously assumed. We propose to rethink the traditional approach of using a single test and instead advocate for using a battery of tests, each capturing a distinct factor. Furthermore, we hypothesize that changes in individual performance over time in one visual test are independent of changes in another visual test.

13. Taxonomic and thematic semantic knowledge as predictors of reading comprehension in aging.

*Caterina Artuso*¹ | *Carmen Belacchi*²

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² Belacchi università di Urbino Carlo Bo

The relationship between working memory and reading comprehension in aging has been widely shown. Moreover, a difference between text genres was shown: whereas narrative text comprehension seems to be preserved in aging, the expository text affects the already limited cognitive resources of the older adults. Though semantic knowledge plays a key role during reading comprehension, there are no studies clearly showing the relation between semantic knowledge and reading comprehension in aging.

In the current research, to investigate the role of semantic knowledge during comprehension, we administered to adults (younger and older) a semantic working memory task, distinguishing taxonomic and thematic knowledge, and two reading comprehension tests (narrative and expository genre).

The results showed that younger adults used flexibly either taxonomic or thematic knowledge, whereas older adults used mainly thematic knowledge (better preserved from age-related decline). Originally, we found that in older adults no specific predictors were found for narrative text comprehension, whereas both thematic knowledge and education level were significant predictors of expository text comprehension. Results were discussed in the light of the possible protective role of education level and mostly, as an instance of cognitive reserve exemplified by the use of thematic knowledge as a residual ability.

14. The influence of bilingualism on gray matter volume within subregions of the hippocampal formation.

by Katharina Peitz^{1,2} | Nora Bittner^{1,2} | Stefan Heim^{2,3} | Svenja Caspers^{1,2}

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The hippocampal formation (HF) shows age-related structural atrophy. Bilingualism is related to higher gray matter volume (GMV) in the HF, which may represent a form of "brain reserve". However, the differential influence of bilingualism on HF subregions remains unclear. Thus, we investigated inter-individual GMV differences and intraindividual GMV trajectories in mono- and bilinguals in the HF and two HF subregions, hippocampus proper (HPr) and subicular complex (SubC). GMV was assessed crosssectionally in 661 adults (257 monolinguals) from the 1000BRAINS study for the bilateral HF, HPr, and SubC using ANCOVAs. For longitudinal analyses over two time points (mean interval: 3.5 years), 220 participants were included (97 monolinguals). Crosssectionally, we found higher GMV in bilinguals in the bilateral HF and SubC. Longitudinal analyses revealed similar GMV trajectories in mono- and bilinguals within all regions of interest. We confirmed higher GMV in bilinguals' HF. With the bilateral HPr showing no effect of language group, bilingualism appears to specifically add brain reserve to regions subserving memory retrieval (SubC) rather than encoding. With similar GMV trajectories for mono- and bilinguals, bilingual brain reserve in the SubC may persist over time. Altogether, our results provide new insights into structural adaptations to bilingualism in the human HF.

15. Future thinking across aging: a cross-cultural perspective.

by Zeinab Khazem¹ | Anne-Lise Florkin¹ | Vinicius Coscioni² | and Elena Cavallini¹ ¹Department of Brain and Behavioral Sciences, University of Pavia, Italy ²Developmental Psychology Section, Psychology Department, Utrecht University, Netherlands

Future-thinking, or prospection, is a flexible cognitive function that allows individuals to mentally project themselves through time. This ability is influenced by self-projection, the availability of choices, and cultural values. It becomes particularly relevant in older age, as time is increasingly perceived as limited, which can impact mental time travel. While prior research highlights the roles of culture and generativity in shaping future-thinking, the interaction between age and cultural values remains underexplored. This study investigates how age and cultural frameworks affect engagement in future-thinking. Participants recruited to date include 150 Lebanese (63 younger, 36 middle-aged, 51 older adults) and 119 Belgians (43 younger, 35 middle-aged, 41 older adults), representing cultures characterized by collectivism and restraint (Lebanon) versus individualism and indulgence (Belgium). Data collection is ongoing. Preliminary results indicate that Lebanese participants engaged more frequently in future-thinking than their Belgian counterparts, possibly reflecting cultural traits such as collectivism and restraint. Additionally, older adults in both cultures reported lower future-thinking frequency, consistent with socioemotional selectivity theory, which suggests that as individuals age, they perceive time as limited and shift away from long-term goals. These findings underscore cultural and developmental influences on prospection and the importance of generative concerns in shaping futureoriented thought.

16. Future time perspective and sense of finitude: effects on memory and emotional regulation in aging.

by Laetitia BRUNO | Aurélia Bugaïska | LEAD université de Bourgogne

This study examines whether broadening older adults' future time perspective (FTP) enhances episodic memory and emotional regulation by alleviating existential anxiety or merely encouraging future-oriented thinking. Based on Lang's (2023) concept of finitude awareness and the socioemotional selectivity theory (Carstensen & Reynolds, 2023), we focused on personal mortality awareness. Older adults (n=118) were assigned FTP horizons of 0, 5, or 20 years; some received health reassurance (HR) indicating continued good health. Main measures were FTP, episodic memory (16-word recall), and emotion regulation strategies.

Results showed that expanding FTP significantly improved memory performance, especially in the 20-year group. The 5-year groups (with and without HR) and the 20-year

group increased unlimited FTP scores regardless of HR, suggesting that projecting into the future enhances the perception of a broader future (Schacter & Madore, 2016). The 5HR group excelled in cognitive reappraisal, supporting that older adults emotionally benefit from nearer temporal horizons (Carstensen & Reynolds, 2023). Distancing from death via HR wasn't necessary for memory gains—as both HR and non-HR groups improved similarly—but appeared to enhance emotion regulation, with the 5HR group showing better cognitive reappraisal. These findings suggest distinct mechanisms: future projection enhances memory, while reducing existential worry aids emotional regulation.

17. Associative memory in older adults: predictors of change across six years.

by Marvin Dophenmont¹ | Erika J. Laukka² | Ruth E. Mark¹ | Moshe Naveh-Benjamin³ | Lars Bäckman² | Yvonne Brehmer¹ ¹ Tilburg University

² Karolinska Institutet

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Within episodic memory, the conscious remembrance of single items and item associations, memory for item associations is especially reduced in older compared to younger adults. Yet, there are large inter-individual differences within age groups. Most studies have investigated predictors of the age-related associative memory deficit using cross-sectional age-comparative data, which impede the interpretation of within-person changes. In this study, we used longitudinal data from a subsample of a population-based study (Swedish National study on Aging and Care in Kungsholmen, SNAC-K), assessed with an item-associative memory task. The sample consisted of 415 subjects, aged 60 years at baseline (M = 60.44, SD = .23). We assessed changes in associative memory independent from item memory across a six-year time interval. We investigated predictors of inter-individual differences in associative memory change which originate from cognitive, health-related, and social domains.

We will focus especially on findings, which are specific for associative memory change (over and above item memory change). These results will help us to better understand which factors account for age-related changes in episodic memory and especially associative memory, which is highly relevant for older adults' everyday life functioning and independence.

18. Examining the effect of picture familiarity on the age- related associative memory deficit.

by Luisa Knopf | Ricarda Endemann | Siri-Maria Kamp | Trier University

In the present study, we tested the idea that the age-related associative memory deficit in episodic memory is influenced by the ease of perceptual processing of the components of an association. To manipulate ease of perceptual processing, half of the participants were familiarized with pictures 24 hours prior to an associative memory task with pairs including these pictures. We hypothesized that prior familiarization would improve associative memory and enhance the frontal slow wave subsequent memory effect (SME) during encoding, reflecting deep elaborative encoding, especially in older adults.

Contrary to our hypothesis, the behavioral results revealed that the age-related associative memory deficit was not influenced by prior familiarization. However, the SME patterns differed between the age groups depending on prior familiarization. Young adults showed

a frontal slow wave SME that did not differ depending on prior familiarization. Older adults, however, showed a trend for an SME with the typical polarity without prior familiarization, but a polarity reversal of the SME after the familiarization phase. This SME patterns suggest that the neural mechanisms of elaboration during associative encoding may be differentially impacted by prior item familiarization in young and older adults.

19. Refining calculations of the ribot temporal gradient: optimising utilisation of the famous faces test.

by Tom Nyhoff | *Yvonne Brehmer*^{1,2} | *Marvin Dophemont*³ | *Francesco Pupillo*¹ | *Katrijn van Deun*⁴ | *Ruth Mark*³

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The famous faces test (FFT) offers the possibility to calculate a Ribot Temporal Gradient (RTG), defined as better memory for remotely vs recently famous faces. The RTG has been found in patients with Korsakoff's syndrome and individuals in early stages of Alzheimer's dementia. Still it is not clear whether it acts as an early marker of neurodegeneration, which is also present in healthy older adults. Additionally, there lacks consensus on how the FFT can be best utilised to calculate the RTG.

Here, 564 older adults (60+) living in the community completed the Dutch version of the FFT (D-FFT) in addition to extensive physical, cognitive, demographic, and health assessments. We will compare statistical models with different operationalizations of the RTG accounting for a combination of stimulus' and participants' characteristics in how well they explain individuals' performance. This will allow us to set standards for calculating the RTG and facilitate more accurate assessment of the RTG at the individual level. Furthermore, we will explore which variables affect intra-individual differences in the RTG. This study increases our understanding of how the D-FFT is best utilised to identify the presence of a Ribot Temporal Gradient in both normal and clinical aging.

20. Memories of age discrimination in relation to older adults' well-being.

by Burcu Demiray | *Kathrin Inerle* | *Miriam Wallimann* | *Andrea Ferrario* | *Erica Benz* | *University of Zürich*

Ageism is the umbrella term for the stereotyping, prejudice and discrimination towards people based on their age. Ageism mostly affects older people. We have been building a citizen science project in Switzerland with an online platform that educates public about ageism, and collects real-life experiences from older citizens. Most of the ageism literature is based on questionnaire data, therefore we contribute to the literature by asking older citizens to share concrete, real-life experiences of ageism. We ask them to write down memories of events when they were thinking, feeling or being treated differently due to their age (by themselves and/or by others). For each narrative, participants are asked to provide self-report on various psychological variables (e.g., How did this experience make you feel?). Data collection is ongoing. Narratives will be analyzed via machine learning including topic modelling and sentiment analysis. We will investigate what types of ageism older adults experience, how they recall these events and interpret them in relation to their well-being. Our preliminary results will be discussed in the context of healthy aging and with regards to the implications of collecting real-life episodes.

21. The role of social factors on intrinsic motivation in prospective memory amongst older adults.

by Maria Arberg Nygaard | Louise Phillips University of Aberdeen

The current study examines the interplay between intrinsic motivation and the ability to plan and execute future intentions (prospective memory; PM). Maintaining PM significantly aids independence in old age. Although previous studies have investigated PM and extrinsic motivation (i.e., coming from external rewards and praise) in aging, little is known about intrinsic motivation (i.e., coming from internal desire to reach a goal). Therefore, the current study investigated the link between PM and intrinsic motivation in health-specific situations likely to be important to older people. Our recent interview studies suggested that social factors were particularly motivating for older adults, so we hypothesized higher intrinsic motivation for social compared to non-social health-related PM scenarios. In a mixedmethod within-subjects experiment, participants (N=120) aged 60-87 were presented with social and non-social health-related PM scenarios and asked to rate their intrinsic motivation following each scenario. Finally, they were presented with open-ended questions on PM, health and motivation. Results from a linear mixed model supported our main hypothesis, suggesting higher intrinsic motivation in PM health-related scenarios with a social (compared to non-social) aspect. Further, intrinsic motivation increased with age irrespective of the social aspect. Findings create a potential for supporting PM ability through social motivation.

22. Spontaneous prospective memory: do younger and older adults differ in noticing an unexpected prospective memory cue?

by Charlotte D.M.A. $Pas^{1} | Alexandra Hering^{1,2,3} | Yvonne Brehmer^{1,4} | Nicola Ballhausen^{1,2}$

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Spontaneous prospective memory (SPM) is the ability to remember and successfully perform an intended action without actively monitoring for the target cue. While the multiprocess theory suggests SPM to be spared throughout aging, empirical evidence proposes a reduced sensitivity of SPM processes in older adults. In this study, we will investigate possible adultage differences in noticing an unexpected PM cue, both behaviorally and in underlying physiological orienting responses. 50 younger (18-30 years) and 50 older participants (65+) are tested using a computerized SPM paradigm, which includes three different ongoing tasks (OT). Participants are instructed that in one of these, the target cue will be presented. However, this cue is shown unexpectedly in a different OT which will induce SPM as participants are not instructed to actively monitor during this specific OT. Data collection is ongoing, preliminary results will be presented focusing 1) on age differences in SPM using behavioral measurements (e.g. accuracy and reaction times) and 2) on underlying spontaneous retrieval processes using physiological indicators (e.g. heartrate and skin conductance). This study will contribute to our understanding of

potential age differences in spontaneous retrieval and whether these are caused by a reduced sensitivity in noticing the cue in older adults.

23. Prospective Memory as a key predictor of everyday functioning in middle and older adulthood in the Canadian Longitudinal Study on Aging.

by Emilie Joly-Burra¹ | Theresa Pauly² | Andrew Wister² | Sascha Zuber¹ | ¹ University of Geneva (Switzerland) ² Simon Fraser University (Canada)

Prospective memory (PM) is the ability to remember to perform planned actions after a delay, such as remembering to pay bills on time, or taking medication. Although PM is considered vital for independence, to date few studies have explored its longitudinal relationship with Instrumental Activities of Daily Living (IADL). Using data from the Canadian Longitudinal Study on Aging (N > 25,000; ages 45-85 at baseline), this study is the first to examine how event- and time-based PM predict IADL over mid- to late-life.

Results show that time-based PM declined with age, while event-based PM showed practice effects. Importantly, zero-inflated General Linear Mixed Models revealed, for the first time, that higher baseline scores in both event- and time-based PM concurrently predicted better IADL outcomes over seven years, even after adjusting for age and education. Thus, findings underscore the separate, but complementary, roles of event- and time-based PM in supporting functional independence. By illustrating PM's impact on the development of life skills crucial for independent living, this study provides valuable insights into aging research and highlights the importance of early support for PM deficits to maintain autonomy in older adults.

24. Baseline cognitive and motor fitness as a predictor of dual- task walking outcomes in older adults: A 12-week RCT on cognitive, motor, and combined training.

by Ina Demetriou¹ | Richard Henson^{1,2}

¹ Medical Research Council Cognition and Brain Sciences Unit, University of Cambridge, UK

² Department of Psychiatry, University of Cambridge, UK

This research investigated longitudinal changes in cognitive performance in a lifespan cohort of healthy adults from the Cambridge Centre for Ageing and Neuroscience (CamCAN). We analysed cognitive scores from 2 to 3 time points with an approximate interval of 12 years between the baseline and last follow-up (n=148). Main tests included the Cattell test (fluid intelligence), Spot the Word (crystallised intelligence), Reaction Time tests and Verbal Memory tests. An initial selectivity analysis on the 'returners' (n=148) versus 'non-returners&' (n=611) was conducted to identify potential biases in the 'returners' population and assess generalisability of findings to the population. Longitudinal changes were assessed using mixed-effects models that aimed to separate cross-sectional effects of age from longitudinal effects of ageing, whilst accounting for baseline-dependent change effects and confounding variables, such as practice effects, sex and education effects. Our results replicated previous differences in longitudinal trajectories: crystallised intelligence and memory declined in an accelerated manner. We are currently relating these trajectories to those in various brain measures derived from repeat MRI and MEG.

25. The impact of hormonal changes on cognitive function in menopause.

by Orsolya Horváth¹ | Petra Csizmadia¹ | Nóra Csikós¹ | Lili Kővári^{1, 2} | Zsófia Anna Gaál¹ | Szabolcs Várbíró^{3, 4}

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Women spend about one-third of their lives in the postmenopausal stage, making it important to explore how the accompanying hormonal changes affect cognitive function, and how hormonal fluctuations over the lifespan contribute to menopausal symptoms. In our ongoing research we compared four groups: (1) women under-going menopause (2) postmenopausal women receiving HRT, (3) postmenopausal women not receiving HRT, and (4) women in perimenopause. Participants completed an online questionnaire, followed by an online cognitive test assessing the five major cognitive domains (memory, attention, executive function, language and perception). Data on demographics, and health status were collected from 400 individuals, with cognitive data available for 149 participants. Preliminary results show that physical symptoms are most severe in perimenopausal women, physical and psychological symptoms contribute to higher depression scale scores. Contrary to previous research, we found no differences in cognitive abilities across the four groups, but language skills varied based on education level, type of menopause (natural, surgical), and reproductive period duration. In conclusion, our results suggest that menopausal symptoms are most severe during the perimenopausal period, and influence depression and anxiety symptoms. However, they have a limited impact on cognitive abilities.

26. Neighborhood quality moderates relationship between sleep duration and cognitive performance.

by Alexa C. Allan¹ | Orfeu M. Buxton¹ | Jacqueline A. Mogle² | Lesley A. Ross² | Christopher G. Engeland¹ | Roland J. Thorpe, Jr.³ | Alan B. Zonderman⁴ | Michele K. Evans⁴ | Alyssa A. Gamaldo² ¹ The Pennsylvania State University

² Clemson University, Institute for Engaged Aging (IEA)

³ Johns Hopkins Alzheimer's Disease Resource Center for Minority Aging Research, Bloomberg School of Public Health |

⁴ Laboratory of Epidemiology and Population Sciences, National Institute on Aging

The current study examined the cross-sectional association between neighborhood quality, self-reported sleep duration, and cognition. Using data from the Healthy Aging in Neighborhoods of Diversity Across the Life Span Sleep Study (HANDLSleep), the analytic sample included 151 community-dwelling Black adults (Mage = 62.18, SDage = 8.28; 73% female) living in Baltimore City, Maryland. Neighborhood quality was assessed using self-reported measures of physical built disorder (e.g., graffiti), social cohesion (e.g., close-knit neighborhood), and social control (e.g., neighbors act if children disrespecting an adult) and the Neighborhood Atlas' Area Deprivation Index (ADI). Participants were administered a psychometric battery including measures of memory, learning, attention, processing speed, and executive function. Multivariable linear regression analyses unexpectedly indicated that lower reported sleep duration was associated with better performance on measures of memory, learning, and attention (p <.05) after adjusting for covariates (i.e., age, sex, poverty status, education quality, medical conditions, depressive symptomology). Significant

neighborhood quality and sleep duration interactions were observed for a measure of executive function and processing speed (p < .05), such that better performance was associated with greater sleep duration, particularly for participants living in more disadvantaged neighborhoods. Findings highlight the importance of neighborhood quality in understanding the link between sleep and cognition.

Saturday, May 10th

KEYNOTE SPEAKER – OVERVIEW

Aula Magna

Alan Gow

Translating 'factors associated with brain health' to 'factors that promote brain health': from observation to intervention

Affiliation: Heriot-Watt University, Edinburgh, UK

Whether and how cognitive functions can be promoted or protected as we age is a central issue within cognitive ageing research. Diverse approaches and methodologies have been used to address this, spanning large-scale longitudinal studies to focussed experimental designs. This keynote will focus on the process of identifying potential lifestyle and behavioural determinants of cognitive ageing to the opportunities to target those within interventions. Determinants of cognitive ageing have primarily been identified from observational studies, and examples will be used to illustrate relatively robust predictors, from activity engagement and physical activity to social connections. In identifying determinants, critical caveats must be considered. These include cause and effect assumptions within observational research, with issues in distinguishing between differential preservation versus preserved differentiation. While lifestyle and behavioural factors are often measured simultaneously within studies, they have commonly been considered on an analysis-by-analysis basis, likely resulting in over-estimates of individual contributions given the non-independence of determinants. Multivariate approaches are, however, becoming increasingly common, with 'marginal gains' providing a framework for considering the cumulative importance of individuals factors. Ultimately, the goal is not simply to identify factors associated with cognitive ageing but to demonstrate how targeted behaviour change might promote or protect functions across the life course. Interventions have developed from early cognitive training studies to complex, whole lifestyle approaches. Translating observation to intervention brings specific challenges, including issues of near and far transfer or scaling from samples to populations. Such challenges notwithstanding, global research collaborations are providing promising evidence, and equally importantly, optimism for the cognitive ageing research agenda.

ORAL TALKS - OVERVIEW

09.45 - 11.15 – Memory

Aula Volta

CHAIR OF THE SESSION – Anne-Lise Florkin

09.45-10.05	Katja Haeuser	Totally off: Older adults misjudge the veracity of their memory contents.
10.05-10.25	Nathaniel R. Greene	<u>A theory of age-related changes in memory</u> specificity.
10.25-10.45	Nicola Ballhausen	<u>Age-related differences in objective, subjective,</u> <u>and everyday-life memory: divergent patterns in</u> <u>prospective and retrospective memory lapses</u> <u>through experience sampling.</u>
10.45-11.05	Gerard Campbell	<u>The impact of age and spontaneous strategy use</u> <u>on real-world visual memory tasks.</u>

09.45 - 11.15 – Training interventions & meta-cognition

Aula Scarpa

CHAIR OF THE SESSION – Federico Curzel

09.45-10.05	Anthony Mangiacotti	Music therapy to support cognitive function, wellbeing, and physiological symptoms in healthy and cognitively impaired older adults: an RCT study.
10.05-10.25	Laura Miraglia	<u>"ToM and Pepper lab"</u> <u>Robotics for cognitive stimulation and social</u> <u>skills: a preliminary study.</u>
10.25-10.45	Zaira Romeo	Recode: a new, open access, web-based platform for cognitive stimulation.
10.45-11.05	Louise Nicholls	Use of everyday memory strategies is related to subjective cognitive abilities across the adult lifespan.

11.45-13.15 - Cognitive & perceptual changes

Aula Volta

CHAIR OF THE SESSION – Federica Salmaso

11.45-12.05	Sarah De Pue	EEG insights into proactive and reactive control in healthy aging.		
12.05-15.25	Eva Van den Bussche	<u>The interplay between cognitive and motor</u> <u>control in aging.</u>		
12.25-12.45	Simone Galati	The impact of the complex interaction of basic mechanisms on reading decline in healthy aging		
12.45-13.05	Matilde Menghini	<u>Parallel semantic reading of multiple words in</u> ageing.		
ORAL TALKS - ABSTRACTS				

ORAL TALKS – ABSTRACTS

Memory

Totally off: Older adults misjudge the veracity of their memory contents.

by Katja Haeuser | Jutta Kray Saarland University

Aging is known to bring along declining memory accuracy generally, and an increase in gistbased false remembering specifically. However, most previous studies used lists of isolated, semantically related words to investigate false memory. This may over-estimate age differences, since constrained lists of single words likely exacerbate gist. We investigated false remembering by means of sentences which constrained expectations towards a particular word but ended in a different lexical item. During encoding, younger and older adults read sentences word by word. During retrieval, their recognition memory was probed for previously seen old words, and previously predictable but not actually presented "lures". New words were also presented. Participants responded on a four-point scale (sure old, maybe old, maybe new, sure new). Results showed an age-related increase in false recognition of lures, even when corrected for response bias. Whereas younger adults allocated comparable rates of false memory judgments to "maybe old" and "sure old" responses, older adults issued nearly three times as many false memory judgments to "sure old" responses. In sum, even when materials are less artificially constrained, aging results in an increase in false remembering. Older adults have difficulty at successfully calibrating their recognition judgments to their declining memory accuracy.

A theory of age-related changes in memory specificity.

by Nathaniel R. Greene | Michael J. Kahana University of Pennsylvania

As we age, our episodic memories become less precise. The mechanisms underpinning these age-related shifts toward more general and away from more specific episodic memories remain to be fully elucidated. We propose a computational modelling approach, rooted in retrieved context theory (RCT), to identify these underlying mechanisms. RCT

proposes that encoding involves binding items to a time-varying representation of context, and retrieval proceeds by re-activating prior contexts to remember associated items. We show that factors that differentially influence context evolution among young and older adults can explain why older adults' episodic memories are typically less specific in nature. These factors include age differences in the tendency to rely on pre-existing semantic relationships and in the sensitivity to integrating unstudied but semantically similar items into the encoding or retrieval context. Our goal is to demonstrate that age-related differences in memory specificity can be accounted for in an RCT framework with minimal assumptions about the source of these differences, paving the way for a parsimonious theory of age-related memory changes.

Age-related differences in objective, subjective, and everyday-life memory: divergent patterns in prospective and retrospective memory lapses through experience sampling.

by Nicola Ballhausen | Yvonne Brehmer Developmental Psychology, Tilburg University, The Netherlands

Prospective memory (PM) refers to remembering future intentions, while retrospective memory (RM) reflects remembering past information.

Younger adults typically outperform older adults on objective laboratory PM and RM tests. Yet, older adults excel in everyday PM (i.e., age-PM paradox). However, findings on subjective memory are mixed: Older adults report more lapses in questionnaires, but daily diary results vary. This complexity highlights divergent memory patterns across age, assessment, and memory type.

The present study extended findings from daily diary studies by assessing memory lapses seven times per day over six days using experience sampling methods (ESM). Lapses were coded into PM and RM. Testing 160 younger and older adults, the study explored age differences in reported memory lapses for PM and RM, separately, and analyzed how ESM data related to objective memory performance and subjective memory questionnaires.

Preliminary analyses suggested more PM than RM lapses in both age groups. While older adults reported more RM lapses than younger adults, the opposite was the case for PM. Objective laboratory measures correlated with ESM data in older but not younger adults. Moreover, subjective measures correlated with ESM in both age groups.

Implications of the findings will be discussed, both methodologically and conceptually.

The impact of age and spontaneous strategy use on real-world visual memory tasks.

by Gerard Campbell¹ | Rebecca Hart¹ | Richard J. Allen² | Claudia von Bastian³ | Melanie R. Burke² | Mario Parra Rodriguez¹ | Louise A. Brown Nicholls¹

- ¹ University of Strathclyde
- ² University of Leeds

³ University of Sheffield

The strategies people use during working memory tasks can impact performance and vary with adult ageing. However, more research is needed to understand how individuals spontaneously use different strategies to remember information, and how this changes with age, particularly using more 'real-world' tasks. In this pre-registered study, 50 younger (18-35 yrs) and 50 older (65-85) adults performed a novel visual binding task in which they briefly viewed everyday objects within realistic, virtual scenes. Participants were asked to

recall the object-colour (Study 1) or object-location (Study 2) bindings. Throughout the task, spontaneous strategy use was reported via both verbal reports and Likert-scale responses probing specific task-relevant strategies. Participants were subsequently given a 'surprise' long-term memory task testing incidental memory for the information presented in the earlier task. Across both studies, we report participants' strategies and any effects of age group. We then assess the impact of age group and strategy use on memory performance, as well as the potential interaction between the two. Overall, the study provides new insights into which strategies are most effective for supporting memory performance in young and older age.

Training interventions and meta-cognition

Music therapy to support cognitive function, wellbeing, and physiological symptoms in healthy and cognitively impaired older adults: an RCT study.

by Dr Anthony Mangiacotti¹ | Dr Emma V. Ward¹ | Sophie Williams² | Clare Barone² | Dr Ming Hung Hsu³ | Professor Michele Biasutti⁴ | Professor Gianfranco Gabai⁴ | Dr Fabia Franco¹ ¹ Middlesex University London ² MHA ³ Anglia Ruskin University ⁴ University of Padova

Music therapy (MT) is a non-pharmacological intervention that demonstrates potential in alleviating psychological stressors associated with aging, making it suitable for social prescribing. However, controlled studies evaluating the effectiveness of MT are limited. Here we share findings from the MusiCare project, which investigated the efficacy of MT interventions in healthy older adults (study 1) and individuals with mild to moderate cognitive impairment living in care facilities (study 2). Both studies used a pre-post RCT design comparing three formats of a 5-month intervention: (i) one-to-one, (ii) small-group, (iii) community MT. Outcome measures focussed on cognition, wellbeing, and physiological markers (salivary cortisol/DHEA ratio and Respiratory Sinus Arrhythmia). The results underscore the biopsychosocial and cognitive benefits of these MT approaches across these populations, offering recommendations on the optimal match between MT type and cognitive functioning level to maximize benefits. Significant improvements in cognition and behavioural symptoms were observed across all MT formats, with healthy older adults particularly benefiting from one-to-one and small-group settings, while cognitively impaired participants showed marked improvements in one-to-one and community settings.

Additionally, the findings suggest how MT can be adapted for preventive community programs, promoting healthy aging and supporting cognitive-behavioural functions in care home settings.

"ToM and Pepper lab" – Robotics for cognitive stimulation and social skills: a preliminary study.

by Laura Miraglia¹ | Giusi Figliano¹ | Federico Manzi¹ | Matteo Nazzario² | Irene Borgini² | Massimo Donini² | Luigi Ruggerone³ | Viviana Martellosio⁴ | Cinzia Di Dio¹ | Antonella Marchetti¹ | Davide Massaro¹ |

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Dementia is one of the leading causes of disability worldwide and has a significant impact on social and financial resources. Dementia often presents as an initial mild cognitive impairment (MCI), which in many cases is a precursor to more severe neurodegenerative disease. This early decline affects memory and Theory of Mind functions. Early intervention

is essential to slow the progression of the disease, and Assistive Social Robotics has shown promise as a non-pharmacological option. This preliminary study investigated the acceptability of the social robot Pepper and evaluated its ability to deliver structured cognitive and socio-cognitive training to elderly people with cognitive decline. The training was carried out using the PRIS platform, a web-based tool developed in collaboration with Intesa Sanpaolo's Innovation Centre. The PRIS platform facilitates the programming of the Pepper application, providing personalized interactions, dynamic dialogues, and realtime data collection. Nine participants, aged between 68 and 93 and suffering from mild to moderate dementia, completed a four-week training program. Qualitative analysis of interviews and session recordings revealed high participant engagement, improved autonomy and concentration, and positive emotional responses. These results are encouraging and suggest the potential of social robots to support cognitive function and emotional well-being through structured training.

RECODE: a new, open access, web-based platform for cognitive stimulation.

by Zaira Romeo¹ | *Vincenzo Livoti²* | *Eleonora Macchia³* | *Adele Ravelli⁴* | *Marianna Noale³* | *Daniela Mapelli¹* | *Mario Bonato¹* | *Giulio Contemori¹* | *Maria Devita¹* |

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Cognitive stimulation is the gold-standard approach to improve cognitive function and quality of life of people with cognitive decline. In this study, we compared the efficacy of a new computerized training approach (RECODE), with respect to a traditional paper-and pencil intervention. RECODE comprises exercises covering main cognitive domains and has an adaptive procedure to select the most appropriate level of difficulty. Twelve patients with mild-to-moderate cognitive decline were trained using RECODE, while other 12 patients attended the traditional intervention. Both trainings were administered by expert neuropsychologists and lasted approximately two months. Mini Mental State Examination (MMSE) and Brief Neuropsychological Examination (ENB-2) were collected before and after the intervention. Groups were matched by age and MMSE at baseline. Mixed-effects models were used to study changes in cognitive scores related to group, time, and their

interaction. After training, the RECODE group showed increased scores at both MMSE (p=0.020) and ENB-2 (p=0.040). The MMSE score did not change following the traditional intervention, while the ENB-2 score slightly increased (p=0.068). Post-training evaluation evidenced a 13% greater increase in MMSE score in RECODE group compared with traditional intervention. These findings suggest that RECODE is a promising tool for cognitive stimulation, with also potential for remote use.

Use of everyday memory strategies is related to subjective cognitive abilities across the adult lifespan.

by Louise Nicholls | Julia-Marie Lukas | Linzi Crawford | Lazaro Jackson University of Strathclyde

The relationship between cognitive strategy use and subjective cognitive difficulties may suggest an active, compensatory process in response to experiencing difficulties. However, the available evidence tends to focus on specific age groups, and on general cognition or memory performance, and findings are mixed. This pre-registered study investigated whether adult age moderates the relationship between strategy use and subjective cognitive difficulties. The sample comprised 606 United Kingdom-based adults aged 18-86 years. Participants completed a survey measuring specific, everyday cognitive difficulties (i.e., attention, language, visual-perceptual ability, and visuo-spatial and verbal memory) and strategy use (generalised and memory-specific). Covariates included gender, depression, anxiety, stress, and the strategy scale not used as the predictor. There was a clear tendency for younger adults to report more frequent use of specific, everyday cognitive strategies than middle-aged and older adults. Moderated regression models also revealed memoryspecific strategy use as a robust predictor of cognitive difficulties, but no interaction effect was observed for any cognitive domain. The relationship between memory strategies and subjective cognition is therefore pervasive across the adult lifespan. The results suggest potential for older adults to incorporate more frequent use of cognitive strategies in everyday life.

Cognitive and perceptual changes

EEG insights into proactive and reactive control in healthy aging.

by Sarah De Pue | Céline Gillebert | Eva Dierckx | Eva Van den Bussche ¹ KU Leuven ² Vrije Universiteit Brussel ³ Alexianen Zorggroep Tienen

As life expectancy increases, declines in cognitive control with age become more prominent, significantly impacting daily life. The Dual Mechanisms of Control theory distinguishes two cognitive control modes. Whereas proactive control works preventively and anticipatory before conflict arises, reactive control detects and resolves conflict only after it occurs. While young adults can flexibly switch between reactive and proactive control, this balance seems to be disturbed in healthy older adults. However, the precise nature of changes in proactive versus reactive control with aging remains debated. Therefore, we are currently administering a proactive-reactive control test battery while simultaneously recording EEG in 40 young and 40 older adults. Preliminary results show indications of decreased proactive and reactive control in old compared to young adults. Interestingly, EEG results show that, instead of not being able to use proactive control, older adults actually over-recruit proactive control and are less able to adapt to the task context. These findings show that EEG is a sensitive tool to detect more subtle differences in proactive and reactive control with age that go beyond behavioral indices. In addition, we will administer this test battery in older adults with Mild Cognitive Impairment to identify objective markers of early cognitive decline.

The interplay between cognitive and motor control in aging.

by Eva Van den Bussche¹ | Sarah De Pue¹ | Gethin Hughes² | Bert Reynvoet¹ | ¹ Brain & Cognition, KU Leuven, Belgium ² Department of Psychology, University of Essex, UK

With aging, both cognitive control (e.g., updating, shifting and inhibition) and motor control (e.g., fine motor control) decline, affecting older adults' daily activities and independence. However, the interplay between cognitive and motor control in aging remains understudied. We addressed this by using a task that concurrently manipulates both cognitive control and motor control exertion. Generally, older adults (N=193) initiated their responses on the task more slowly and responded slower than young adults (N=137). Compared to young adults, older adults seemed to sacrifice the preparation of the cognitive task (i.e., larger difference between congruent and incongruent trials in initiation times) in order to prioritize the preparation of the motor task (i.e., smaller difference between trials requiring less and more motor control in initiation times). Despite this preparatory strategy, older adults showed less efficient motor control exertion in their reaction times. Interestingly, in the reaction time data, they showed a smaller congruency effect (indicating more efficient cognitive control exertion) when the required motor control was high as opposed to low. This was not observed in young adults. These findings indicate that there are notable difference between older and young adults when task performance requires both cognitive and motor control.

The impact of the complex interaction of basic mechanisms on reading decline in healthy aging.

by Simone Galati¹ | Sara Pegoraro^{1, 2} | Alessio Facchin^{1, 2, 3} | Camilla Frontoni¹ | Francesca Luchesa¹

| Elena Rolandi^{4, 5} | Antonio Guaita⁴ | Lisa S. Arduino⁶ | Roberta Daini^{1, 2, 7}

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Aging leads to a physiological decline in many cognitive functions, even without pathological processes. These cognitive changes affect the elderly's quality of life and wellbeing, impacting their daily activities. Reading is among the skills most affected by aging since it requires the integrity of several cognitive components, such as linguistic, visual, oculomotor, and attentional processes. While language remains largely intact, visual and cognitive components may decline, affecting reading efficiency. Visuospatial attention and crowding are both involved in the reading process, but their roles in age-related changes in reading remain unclear. Our study aimed to investigate the presence of an actual decline in reading and the implications of crowding and visuospatial attention in this potential age-related decline. 120 neurologically healthy older adults (age range 60-88) underwent neuropsychological assessment to investigate global cognitive functioning, reading skills, crowding, and attention components. We found a decline in reading abilities, not in visual acuity, crowding, or visuospatial attention. Interestingly, we found that the Symbol Digit Modalities Test fully mediated the relationship between aging and reading. This complex task involves attention, working memory, and processing speed. The age-related decline in reading could be considered a consequence of the complex interaction among these basic mechanisms.

Parallel semantic reading of multiple words in ageing.

by Matilde Menghini¹ | Silvia Primativo² | Valentina Bandiera² | Laura Veronelli¹ | Carlotta Lega¹ | Luisa Girelli¹ | Fabrizio Zeri¹ | Roberta Daini¹ ¹ Università degli Studi di Milano-Bicocca ² LUMSA

Reading, like other complex abilities, can change with age and older adults may experience fatigue and rely more on contextual cues for compensation. Reduced visual acuity and increased crowding likely narrow the visual span, which in turn could affect semantic processing in parafovea and slow down reading.

We investigated these age-related differences by examining parafoveal-on-foveal and parafoveal preview effects using the Rapid Parallel Visual Presentation paradigm (Primativo et al., 2022).

Specifically, we assessed whether adults aged 65+ show diminished parafoveal semantic processing and whether visual span limitations contribute to reading slowdown. We hypothesize longer reading times for older adults compared to younger participants, maintained accuracy for foveal words but reduced accuracy for parafoveal words and a decreased visual span.

Preliminary, we assessed visual parameters with an optometric examination, and we excluded those participants with low vision.

Participants read pairs of words presented for 150 ms, and we recorded reaction times and accuracy. Preliminary results from 25 young adults (M age = 25.85 years) show faster reading times and higher accuracy for semantically related pairs, replicating findings by Primativo et al. (2022). Our next step will be the enrollment of 25 older adults (ages 65–75) to explore age-related reading differences.

SYMPOSIA – OVERVIEW

Aula Magna

09.45-11.15 - Decision making

Decision-making processes in older adults: The role of cognitive and emotional factors in financial and healthcare choices.

Chairs	Laura Colautti & Paola Iannello	
Speakers	Tindara Capri	Can risk-taking propensity be a trait that captures individual differences across measures and time? Age patters and cognition.
	Chiara Barbara Dadà	<u>Uncovering susceptibility to fraud in aging:</u> <u>analysis of the phenomenon and proposals</u> <u>for prevention</u> .
	Silvia Riva	Reasoning processes and cognitive patterns in vaccine hesitancy – a focus on SARS-CoV- 2 Booster uptake among individuals aged 50+ in the UK.

11.45-13.15 – A complex systems perspective on Aging

A complex systems perspective on aging.

Chair Richard Ridderinkhof

Speakers	Almar Kok	Adopting a complex systems approach to functional aging: key principles and empirical example using dynamic time warping.
	Kaisa Koivunen	Using network analysis to examine the interplay between perceived fatigability, physical activity and intrinsic capacities in older adults.
	Arko Ghosh	Functional states in healthy aging based on smartphone behavior.
	Richard Ridderinkhof	Complex systems modeling of age-related decline across biological, psychological, and social domains: a cascade theory of aging.

SYMPOSIA – ABSTRACTS

Decision making

Decision-making processes in older adults: The role of cognitive and emotional factors in financial and healthcare choices.

by Tindara Capri¹ | Chiara Barbara Dadà² | Barbara Colombo³ | Silvia Riva⁴ Chairs: Laura Colautti² | Paola Iannello²

¹ Department of Life and Health Sciences and Health Professions, Link Campus University, Rome, Italy

² Department of Psychology, Università Cattolica del Sacro Cuore, Milan, Italy

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Decision making is fundamental in everyday life, supporting individuals' autonomy and well- being. As age increases, it becomes crucial to better understand how to prevent potential impairments in decision making in order to avoid consequences that could negatively affect the quality of life and the whole aging process.

The present Symposium aims to present a series of contributions specifically focused on older adults which deepen the role of both cognitive and emotional factors underlying risktaking behavior, and decisions in financial and healthcare domains. A comprehensive indepth understanding of these aspects appears fundamental to empower functional decisions during aging through designing effective communication and prevention strategies.

TALK 1: CAN RISK-TAKING PROPENSITY BE A TRAIT THAT CAPTURES INDIVIDUAL DIFFERENCES ACROSS MEASURES AND TIME? AGE PATTERNS AND COGNITION.

by Tindara Capri

Authors: Tindara Capri | Giulia Picciotto

Department of Life and Health Sciences and Health Professions, Link Campus University, Rome, Italy

This study examines general risk propensity and specific risk-taking in different age groups. Previous research indicates a U trend in risk propensity throughout the life cycle, peaking in adolescence and older age. It is hypothesized that adolescents are more likely to engage in risky behaviors in specific contexts compared to young adults and adults.

A sample of 231 subjects aged between 14 and 70 years (M = 42.25; SD = 17.82) was divided into four age groups: 31 adolescents (14-24 years), 34 young adults (25-39 years), 30 adults (40-60 years), and 36 older adults (61-70 years). Participants completed the Sensation Seeking Scale (SSS), Risk Propensity Scale (RPS), Tests of Self-Conscious Affect-III (TOSCA-3) and Big Five Inventory (BFI).

Results indicate that adolescents and young adults exhibit similar levels of risk-taking, confirming that risk propensity peaks in adolescence and declines into adulthood. Young adults display riskier behaviors than adolescents in seeking unconventional experiences. While no significant differences in affectivity were found, risk-taking was positively correlated with extraversion, agreeableness, and conscientiousness across all groups. These findings highlight the need for educational initiatives aimed at addressing personality traits in adolescents to reduce negative risk-taking.

This project is funded by the European Union-Next Generation EU.

TALK 2: UNCOVERING SUSCEPTIBILITY TO FRAUD IN AGING: ANALYSIS OF THE PHENOMENON AND PROPOSALS FOR PREVENTION.

by Chiara Barbara Dadà¹

Authors: Chiara Barbara Dadà^l | Laura Colautti^l | Alessia Rosi² | Elena Cavallini² | Alessandro Antonietti^l | Paola Iannello^l

¹Department of Psychology, Università Cattolica del Sacro Cuore, Milan, Italy ²Department of Brain and Behavioral Sciences, University of Pavia, Pavia, Italy

Frauds and scams are widespread worldwide both resulting in significant monetary losses for the population and society and causing detrimental psychological consequences to victims and their families. This research provides a comprehensive analysis of the phenomenon in Italy, focusing on identifying the main risk factors for different types of fraud in different age groups.

Starting from a systematic review, several individual variables – including sociodemographic, psychological, and cognitive ones – were identified as significant risk factors. Based on these findings, we conducted a survey on a representative sample of 500 Italian adults and older adults to assess the prevalence of scams in Italy and identify the main individual variables involved. Our analysis outlined different individual factors between victims and non-victims across the lifespan.

Finally, 50 elderly victims of scams underwent an individual assessment including psychological and cognitive tools to develop comprehensive risk profiles, recognizing the specific challenges faced by this target group, such as loneliness and cognitive decline.

Our results provide valuable insights into individual characteristics that increase susceptibility to scams, identifying modifiable and non-modifiable risk profiles to guide future prevention strategies.

TALK 3: REASONING PROCESSES AD COGNITIVE PATTERNS IN VACCINE HESITANCY - A FOCUS ON SARS-COV-2 BOOSTER UPTAKE AMONG INDIVIDUALS AGED 50+ IN THE UK.

by Riva Silvia Authors: Riva Silvia | Samuel Lam School of Allied Health, and Life Sciences, St Mary's University, Twickenham, London, U.K.

Background:

New variants of SARS-CoV-2 have highlighted the critical role of booster vaccinations as a public health strategy. However, the uptake of booster jabs among individuals aged 50 and above has shown considerable variation, influenced by factors such as ethnicity, socioeconomic background, and education level.

Methodology:

The TRUST study aimed to explore these cognitive and psychological dimensions by conducting qualitative interviews with 30 individuals aged 50+ who declined booster vaccinations, recruiting 15 participants each from South London and the West Midlands. Data were thematically analyzed using NVivo V.12, with transcripts generated by Otter.ai. **Results**:

Thematic analysis revealed four key themes: 'Vaccine production and administration,' 'Health (mis)information and beliefs,' 'Personal circumstances and social influences,' and 'Policy and logistical factors.' The analysis also uncovered important cognitive patterns, including the influence of epistemic trust—the level of confidence in the knowledge provided by others—and the bandwagon effect, where individuals' decisions are shaped by the perceived behaviour of their social group.

Conclusion:

The TRUST study sheds light on the reasoning processes, cognitive biases, and psychological constructs influencing SARS-CoV-2 booster hesitancy among individuals aged 50+. These findings emphasize the need for health promotion strategies that account for diverse cognitive patterns and social influences.

A complex systems perspective on aging

A complex systems perspective on aging.

*by Almar Kok*¹ | *Kaisa Koivunen*² | *Arko Ghosh*³ | *Richard Ridderinkhof*⁴ | *Chair: Richard Ridderinkhof*⁴

¹ Amsterdam UMC, Department of Epidemiology & Data Science, Amsterdam, The Netherlands

² University of Jyväskylä, Faculty of Sport and Health Sciences and Gerontology Research Center, Finland

³ Cognitive Psychology Unit, Institute of Psychology, Leiden University, The Netherlands ⁴ Dept. of Psychology, University of Amsterdam, The Netherlands

Later adulthood is marked prominently by declines in physical health, cognitive capacities, and shifts in social networks. Still, most aging research remains entrenched in approaches that overlook the complexity of multifaceted aging-related changes in the functioning and well-being of aging individuals across domains. In accordance with recent and urgent calls, here we propose to research aging and its dynamics from a complex systems perspective, accounting for the intricate interplay of physical, psychological, and social factors. This symposium will unite interdisciplinary experts to explore how embracing the concepts, language, and computational models of complexity science can transform our understanding of aging.

TALK 1: ADOPTING A COMPLEX SYSTEMS APPROACH TO FUNCTIONAL AGEING: KEY PRINCIPLES AND EMPIRICAL EXAMPLE USING DYNAMIC TIME WARPING.

by Almar Kok

Authors: Almar Kok¹ | Martijn Huisman¹ | Erik J. Giltay² | Gabriela Lunansky¹ ¹ Amsterdam UMC, Department of Epidemiology & Data Science, Amsterdam, The Netherlands ² Leiden University Medical Center, Department of Psychiatry, Leiden, The Netherlands

Related to but distinct from biological and environmental systems, we define functional ageing as the system of interacting changes in physical and mental body functions, behavioural factors and social participation that occur as individuals age. We propose that a complex systems perspective to functional ageing can illuminate how outcomes such as quality of life and longevity, and prevention and treatment success emerge from dynamic interactions among these domains, rather than from isolated causes. To support this view, we briefly explain how three principles of complex systems science – resilience, non-linearity and heterogeneity – could apply to functional ageing. Then, we show results from our analysis of the temporal ordering of fifteen aspects of functional ageing using dynamic time warping applied to empirical data. The analysis was based on 4-10 repeated observations across 10-30 years in N=1560 participants aged 55 and over in the Longitudinal Aging Study Amsterdam, the Netherlands. The results showed that in the general population, changes in cognitive and physical functioning tends to show no clear temporal

ordering. Latent class analysis revealed various subgroups with variations on these temporal orderings.

TALK 2: USING NETWORK ANALYSIS TO EXAMINE THE INTERPLAY BETWEEN PERCEIVED FATIGABILITY, PHYSICAL ACTIVITY AND INTRINSIC CAPACITIES IN OLDER ADULTS.

by Kaisa Koivunen

Authors: Kaisa Koivunen¹ | Lotta Palmberg¹ | Gabriela Lunansky² | Almar Kok² | Nancy Glynn³ | Rachel Cooper⁴

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Background: Fatigability - an individual's fatigue when performing standardised activities - may play an important role in the disablement process. We employed network analysis to investigate the complex associations between perceived physical and mental fatigability, physical activity (PA) and intrinsic capacities (ICs).

Methods: We ran cross-sectional analyses of data on participants from the MRC National Survey of Health and Development at age 60-64 (n=1537). Physical and mental fatigability were assessed using the Pittsburgh Fatigability Scale. PA in the last 4 weeks was self-reported. We quantified five IC domains: vitality, locomotion, cognition, psychology, and sensory, using performance-based measurements and questionnaires. Networks were estimated based on Mixed Graphical Models stratified by sex.

Results: In both sexes, physical and mental fatigability were positively associated with the IC domains of psychology (measured with mastery) and locomotion (walking speed, chair rise) and PA. The network structure showed that the locomotion and psychology domains and PA were related through physical fatigability while mental fatigability did not mediate the associations between ICs and PA.

Conclusions: Perceived physical fatigability is a potentially important pathway between lower physical and mental resources and activity behaviour in older adults. Future work is needed to study the temporality of these associations.

TALK 3: FUNCTIONAL STATES IN HEALTHY AGING BASED ON SMARTPHONE BEHAVIOR.

by Arko Ghosh Author: Arko Ghosh Cognitive Psychology Unit, Institute of Psychology, Leiden University, The Netherlands

Our daily behaviors fluctuate considerably, resembling the ups and downs we experience. Smartphone interactions provide a reliable, objective lens for observing these variations, offering insights into behavioral changes over adulthood through complex-systems approaches. First, we uncover multi-day oscillations in smartphone interactions, tracked through touchscreen logs collected over several months. These oscillations are not random; they are tied to specific behaviors and remain stable across the adult lifespan, even though major aging events like menopause and retirement. This reveals that some behavioral rhythms persist independently of biological aging milestones. Second, we find that certain age-related smartphone behaviors show stable yet distinct patterns, separated by tipping points. Observed over periods up to four years, individuals' smartphone behaviors appear "younger" on some days and "older" on others, suggesting age-related stability interspersed with shifts. By applying concepts like critical transitions and tipping points, we demonstrate that older adults are less resilient to forces that push behavior into an "older" state, suggesting a natural yet complex ebb and flow in behavioral age. These findings suggest that aging research could benefit from a new perspective—one that recognizes and explores the intricate fluctuations in behavior across the lifespan, rather than focusing solely on linear decline.

TALK 4: COMPLEX SYSTEMS MODELING OF AGE-RELATED DECLINE ACROSS BIOLOGICAL, PSYCHOLOGICAL, AND SOCIAL DOMAINS: A CASCADE THEORY OF AGING.

by Richard Ridderinkhof⁴

Authors: Richard Ridderinkhof⁴ | Sophie Hendrikse² | Marcel Olde Rikkert³ | Han van der Maas¹ ¹ Dept. of Psychology, University of Amsterdam, The Netherlands ² Dept. of Psychology, University of Tilburg, The Netherlands ³ Dept. of Geriatrics, University Medical Center, Radboud University, Nijmegen, The Netherlands

Later adulthood is marked prominently by declines in physical health, cognitive capacities, and shifts in social networks. Surprisingly, no theory of aging exists that integrates and explains the structure and dynamics of this multifaceted process across domains. Here we aim to understand aging from a complex systems perspective, accounting for the intricate interplay of biological, psychological, and social factors. Building on the ecological concept of resilience, we propose that aging can be viewed as a progression through various distinct but variable stages, characterized by abrupt or more gradual transitions between stable, resilient states. To capture these interdependencies comprehensively, we explore the nonlinear dynamics of aging using network theory, highlighting resilience to perturbations and phase transitions as critical aspects. We present two concrete models based on cascades of catastrophe models and cascading networks to demonstrate how perturbations in one domain can cascade into large-scale decline across domains in a stepwise fashion. Emerging from a complex systems perspective, our novel Cascade Theory of Aging holds promise for unraveling the intricacies of aging and advance our understanding of this multifaceted process.

CONFERENCE ATTENDEES

Guilia Arenare Caterina Artuso Christopher Atkin Nicola Ballhausen Guido Band Chiara Barattieri di San Pietro Marios Biskas Nora Bittner Mario Bonato Laurie Borel Erika Borella Francesca Bosco Sara Bottiroli Jana Isabelle Braunwarth Yvonne Brehmer Laetitia Bruno Gerard Campbell Martina Cangelosi Elena Carbone Keith Carlson Tindara Capri Benedict James Caspari Elena Cavallini Irene Ceccato Grazia Cerullo Laura Colautti Fabienne Collette Ilaria Corbo Alessandra Cucinelli Federico Curzel Chiara Barbara Dadà Roberta Daini Sarah De Pue Ina Demetriou Febe Demeyer Burcu Demiray Riccardo Domenicucci Marvin Dophemont Mihalis Doumas Natalie Ebner Ierri Edwards Beth Fairfield Laura Favilli Nicola Ferdinand Leah Ferguson Anne-Lise Florkin Lara Fracassi Camilla Frontoni

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