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Editorial

Dear Readers,

This issue of the newsletter includes a mixture of different types of contributions.

First, alumnus Goran Papenberg provides an overview of the relationship between epigenetics and cognitive and brain aging, describing DNA methylation, one of the mechanisms by which the environment can influence the expression of genes. He also presents his current project, using data from the two largest PET studies on dopamine in healthy humans to date.

Janne Adolf, another MPIB alumna, introduces us to Leuven, the small town in Belgium where she is doing her postdoc and finding that she is enjoying life there despite the initial worry that she would miss city life in Berlin. Her report reminds us of the typical experiences of academics, moving around and settling in new places all over the world, often finding their own preconceptions overruled. Janne has also taken almost all of the beautiful photos in her article.

It is again time to announce the competitition for the LIFE Outstanding Alumni Award 2021. Please consider applying if you are eligible and make a note of the deadline!

This is followed by the abstracts of the blitz talks held by fellows at the online Spring Academy hosted by LIFE Michigan in May. A group photo was obviously impossible, but we do have some screen shots of the participants thanks to Jacqui Smith.

Xin (Cynthia) Tong from UVA has answered our 10 questions, which have been changed a little to reflect the pandemic situation. Her interesting responses reflect her important work on methodology for longitudinal study design and data analysis.

We next thank the many alumni who took part in this semester's LIFE seminar in Berlin. The online format necessary due to the pandemic does have its advantages in terms of making international exchange much easier.

We introduce two new LIFE members in Zurich: Alumna Stefanie Wermelinger joins as a faculty member, Sabrina Becker as a fellow. Finally, new publications and LIFE news complete this edition, along with a mention of LIFE's (quite) new Twitter account.

As always, we are indebted to all contributors! The sunflowers illustrating this edition are for them.

Julia Delius

Photo: Jeb Buchman on Unsplash

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Reminder

Fellows, alumni, and faculty, please keep us informed about your LIFE-relevant news (e.g., awards, career moves)! Fellows and alumni, please check that your web profiles are up-to-date—they are often the first thing that pops up when your name is googled! Send your updates to delius@mpib-berlin.mpg.de

LIFE Website: www.imprs-life.mpg.de

What Can We Learn About Human Cognitive and Brain Aging From Epigenetics?

Goran Papenberg, MPIB alumnus, now Senior Researcher at the Aging Research Center, Stockholm University and Karolinska Institute, Stockholm, Sweden

goran.papenberg@ki.se

How can you change your genes by changing your lifestyle? This catchy question sums up the promise and potential of epigenetics, which is essentially additional information layered on top of our genes. But how does epigenetic information impact our genes or something as complex as cognition? Genes contain the coded formula cells need to produce proteins, which influence cognition through the molecular functioning at the neural level. Environmental and lifestyle factors can influence to what extent proteins are expressed through epigenetic mechanisms (e.g., Fernandes et al., 2017). This is one reason why the way we live our lives may have a large impact on our cognition as we age.

Cognition, dopamine, and aging

Since my times as a LIFE fellow and PhD student, I have been interested in how genetic and environmental factors interact with each other to shape inter-individual differences in cognitive aging. My research interest focuses on the neurotransmitter dopamine (DA), which supports molecular mechanisms central for various cognitive functions (Bäckman et al., 2006). Both DA transmitter availability as well as DA receptors are necessary for signal transmission in the brain. Age-related decline in the DA system has been suggested as a central mechanism behind cognitive aging (Bäckman et al., 2006). Approximately 100 imaging studies suggest impairments of the DA system with advancing age (Karrer et al., 2017), in particular with respect to DA receptors. However, interestingly, predictors of age differences and decline in the DA system are largely unknown. In the following, I hypothesize that changes in the DA system may be driven by epigenetic changes associated with certain disadvantageous lifestyles.

DNA methylation in blood and brain

DNA methylation is currently the best characterized epigenetic mechanism (see Figure 1) and can be assessed from peripherally drawn blood or saliva samples (Nikolova & Hariri, 2015). When located in the promoter region of a gene, DNA

The Aging Research Center is located at Karolinska Institutet, Campus Solna.
Photo: Ulf Sirborn

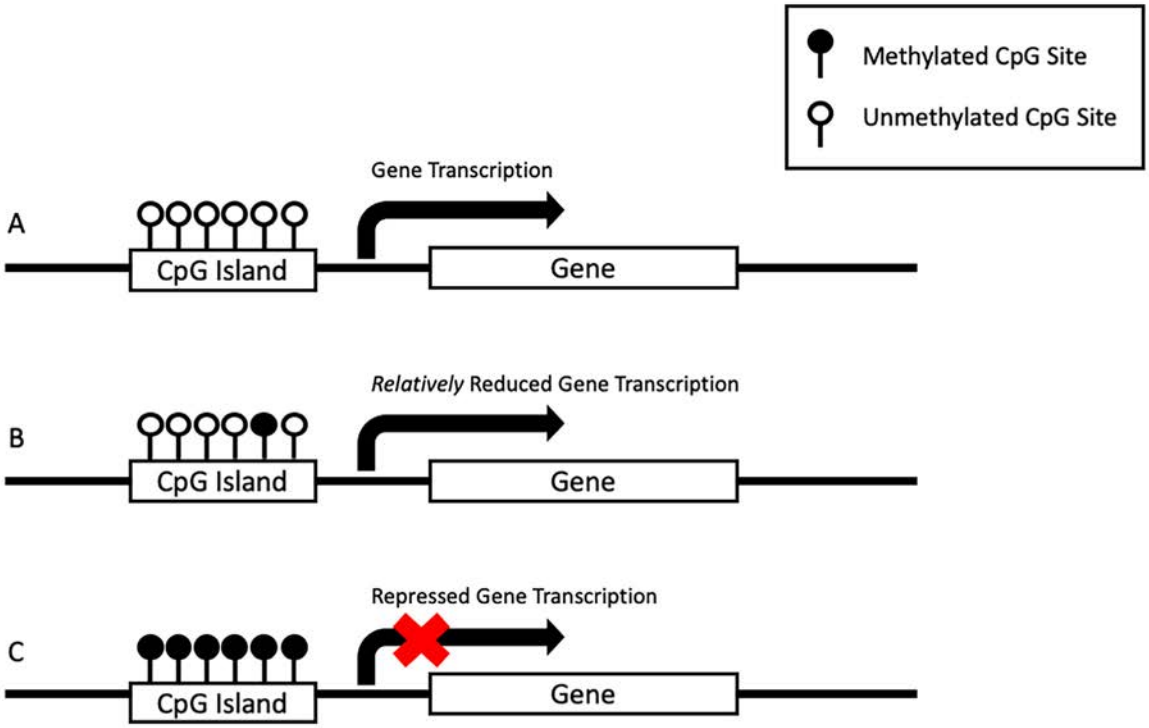

Figure 1. Methylation of CpG islands near gene promoters is typically associated with reduced transcription initiation. CpG sites are regions of DNA where a cytosine nucleotide is followed by a guanine nucleotide. CpG islands are regions with a high frequency of CpG sites. (A) Gene is transcribed when CpG island has no methylated site, (B) transcription is relatively reduced with some methylated CpG sites, and (C) gene is repressed if all CpG islands are methylated. Reproduced with permission from Nikolova & Hariri (2015).

methylation (at CpG sites) acts to repress gene transcription (see Figure 1). A common and important critique of peripheral measures of DNA methylation is that they do not necessarily reflect methylation in the brain. More recently, a data base has been made available documenting correlations between DNA methylation in peripheral biomarkers and brain tissue (Braun et al., 2019, see http://han-lab.org/methylation/default/imageCpG). Blood, saliva, and live brain tissue samples were collected from 27 patients with medically intractable epilepsy, who underwent brain resection. In terms of DA genes, it was interesting to see that methylation profiles are highly correlated in the periphery and brain tissue (e.g., correlations based on blood are: $r > .87$). Note, however, that methylation in brain tissue and peripheral markers may be correlated only for some CpG sites. So far, it is not known whether peripheral blood markers of DNA methylation of specific DA genes would also be related to in vivo measures of the specific protein in the brain, such as the two main DA receptor types: D1- (DRD1) or D2-receptors (DRD2). There is, however, some initial evidence from patient studies. Low methylation rates in blood in the promotor regions of the DRD2 gene were documented in schizophrenia patients, presumably resulting in high DRD2 levels at the neural level (Funahashi et al., 2019; Yoshino et al., 2016). The latter two patient studies did not assess DRD2 receptors in the brain. Currently, only imaging methods, such as positron emission tomography (PET), can measure DA receptor availability in the living human brain.

Dopamine gene DNA methylation and its link to cognition

Environmental effects on gene expression have been shown in twin studies. Despite identical genomes, monozygotic twins become more discordant with aging due to DNA methylation (Talens et al., 2012). This suggests that differences in lifestyles may regulate gene expression across the lifespan. In terms of cognition, differences between 48 monozygotic twins in methylation profiles of DA genes predicted differences in cognitive abilities for which DA is crucial, such as inhibition of unwanted information and short-term memory (Lewis et al., 2019). Epigenetic-cognitive associations were observable, despite very small non-shared environmental influences among adolescent twins. Thus, influences of epigenetic differences on cognition may be even more pronounced in unrelated persons.

Dopamine gene methylation and lifestyle influences

Both genetic and non-genetic factors contribute to DA receptor availability in the adult human brain (Borg et al., 2016), with about one third of variation related to environmental factors. Previously, we reported that more intense self-rated physical activity and lower cardiovascular risk are associated with higher DA receptor availability and better long-term memory in old age (Karalija et al., 2019; Köhncke et al., 2016). This is in line with exercise intervention studies that have documented both increased availability of DA and its receptor after intervention (Jonasson et al., 2016; Robertson et al., 2015). Moreover, better cardiovascular health has been related to a more preserved DRD1 system (Rieckmann et al., 2016).

At the same time, our lifestyle choices may be genetically driven (Plomin & Deary, 2014). That is, a genotype or genetic profile may be more frequently associated with a particular environment. In a recent study, we used accelerometers to measure physical activity in older adults during one week. Interestingly, individuals with genetic predispositions for higher DA signal efficacy also engaged more in moderate-to-vigorous physical activity (Dohrn et al., 2020). We speculated that individual differences in dopaminergic modulation may influence motivation and reward processes relevant for engaging in more intense physical activity, which was stronger among older adults.

These lifestyle–DA associations are likely mediated through epigenetic mechanisms. Current evidence comes mainly from addictive behaviors in relation to DRD2. For instance, individuals with a lifetime history of pathologic gambling who are able to abstain from gambling had significantly lower DRD2 methylation levels than others who continued gambling (Hillemacher et al., 2015). Another study found that patients undergoing alcohol withdrawal showed an increase of DRD2 methylation during early abstinence, particularly in the promoter region of the DRD2 gene (Hillemacher et al., 2019). Additionally, smoking, compared to non-smoking subjects, had significantly higher DRD2 methylation patterns (Hillemacher et al., 2019). Moreover, a high-fat diet alters methylation and gene expression of DA genes (Vucetic et al., 2010), and DA gene methylation is positively associated with obesity markers and carbohydrate intake (Ramos-Lopez et al., 2018). Together, these studies suggest that DA gene methylation is sensitive to behavioral and lifestyle habits. Thus, it is reasonable to hypothesize that the negative effects of physical inactivity and cardiovascular risk (e.g., high BMI, smoking) on DRD2 receptor availability, cognition, and brain function are mediated through DNA methylation. Moreover, these associations likely extend to DRD1s as well, since higher DRD1s have also been associated with physical activity and cardiovascular health (Rieckmann et al., 2016; Ruegsegger & Booth, 2017).

Human aging and the epigenetic clock

In the context of aging, most studies have focused on the epigenetic clock, which is a proxy for biological age. A commonly used epigenetic clock, which was developed by Horvarth (2013), is based on 353 DNA methylation markers (i.e., CpG sites) and has been shown to be maximally predictive of chronological age in various tissues. It has been suggested that the epigenetic clock may capture maintenance mechanisms of cells (Horvath & Raj, 2018). As compared to DNA methylation of DA genes, which may have differential associations with age across individuals, the epigenetic clock is consistently linked to age across individuals (Jones et al., 2015). A younger epigenetic age has been related to higher education, more physical activity, low body mass index (BMI) (Quach et al., 2017), cardiovascular health (Hillary et al., 2019), more preserved brain integrity (Hillary et al., 2019), and better memory functioning (Degerman et al., 2017). In terms of links to the DA system, it has been shown that patients with Parkinson's disease have an older epigenetic age compared to controls (Horvath & Ritz, 2015). Thus, the epigenetic clock may impact age-related changes in the DA system. Consequently, it is likely that DA-related gene methylation and the epigenetic clock have unique and shared contributions to DA receptor availability, lifestyle, cognition, and brain function. The shared contributions are likely due to association to similar lifestyle factors (e.g., physical activity, BMI). However, the relative importance of the contributions remain an empirical question.

Future plans

There has been great interest in DNA methylation given reported links to aging, but also to neurodevelopmental disorders and psychiatric diseases. Together with my colleague, Nina Karalija

(Umeå University, Umeå, Sweden), I have initiated an ongoing project to investigate some of the key questions raised above.

We use data from the two largest DA-PET studies in healthy humans to date (both around 180 participants). The average sample size of PET studies is typically 21 (Karrer et al., 2017), likely due to the high cost of nuclear imaging methods. The Cognition, Brain and Aging (COBRA) study is a 10-year longitudinal multimodal imaging study with a focus on DRD2 availability, which is assessed using PET and the radioligand 11C-raclopride (PIs: Lars Bäckman, Lars Nyberg, Katrine Riklund, Martin Lövdén, and Ulman Lindenberger; see Nevalainen et al., 2015). Since data were collected at three measurement occasions, separated by five years, we will be able to address the question whether DRD2 DNA methylation also predicts declines in cognition and DRD2 availability. By contrast, the DopamiNe Age connectoMe Cognition (DYNAMIC) study is a lifespan study and includes participants of ages 20–80 years (n = 180; PI: Alireza Salami) and maps DRD1 availability using PET and the radioligand 11C-SCH23390. Both PET studies assess the same cognitive, brain imaging (except for the radioligand), and lifestyle measures.

The goal of our project is to determine whether high DNA methylation of DA-related genes (assessed via blood samples), presumably reflecting lower gene expression, is associated with: (I) older age, (II) interindividual differences, and annual decline rates, in DA receptor availability in the living human brain, (III) impaired cognitive and brain functioning in old age, and (IV) a disadvantageous lifestyle (i.e., physical inactivity and poor cardiovascular health). We will also test the alternative hypothesis that older epigenetic age, as indicated by the epigenetic clock, is associated with less favorable outcomes for the measures of interest.

With our large-scale PET data, we will be able to link DA receptor gene methylation in blood to receptor availability in the living human brain. We believe that this information alone will be of high relevance for researchers investigating clinical populations (including effects of DA-related drugs), in which epigenetic changes, changes in the DA system, and cognitive impairments have also been observed (e.g., schizophrenia, Parkinson's disease, ADHD). Apart from that, the investigation of epigenetic biomarkers is an important step towards understanding how genes together with environmental factors shape brain and cognition changes across the adult lifespan.

References

Bäckman, L., Nyberg, L., Lindenberger, U., Li, S.-C., & Farde, L. (2006). The correlative triad among aging, dopamine, and cognition: Current status and future prospects. *Neuroscience and Biobehavioral Reviews, 30*(6), 791–807. https://doi.org/10.1016/j.neubiorev.2006.06.005

Borg, J., Cervenka, S., Kuja-Halkola, R., Matheson, G. J., Jönsson, E. G., Lichtenstein, P., Henningsson, S., Ichimiya,T., Larsson, H., Stenkrona, P., Halldin, C., & Farde, L. (2016). Contribution of non-genetic factors to dopamine and serotonin receptor availability in the adult human brain. *Molecular Psychiatry, 21*(8), 1077–1084. https://doi.org/10.1038/mp.2015.147

Braun, P. R., Han, S., Hing, B., Nagahama, Y., Gaul, L. N., Heinzman, J. T., Grossbach, A. J., Close, L., Dlouhy, B. J., Howard III, M. A., Kawasaki, H., Potash, J. B., Kawasaki, H. (2019). Genome-wide DNA methylation comparison between live human brain and peripheral tissues within individuals. *Translational Psychiatry, 9,* Article 47. https://doi.org/10.1038/s41398-019-0376-y

Degerman, S., Josefsson, M., Nordin Adolfsson, A., Wennstedt, S., Landfors, M., Haider, Z., Pudas, S., Hultdin, M., Nyberg, L., & Adolfsson, R. (2017). Maintained memory in aging is associated with young epigenetic age. *Neurobiology of Aging, 55,* 167–171. https://doi.org/10.1016/j.neurobiolaging.2017.02.009

Dohrn, I., Papenberg, G., Winkler, E., & Welmer, A. (2020). Impact of dopamine-related genetic variants on physical activity in old age: A cohort study. *International Journal of Behavioral Nutrition and Physical Activity, 17*(1), Article 68. https://doi.org/10.1186/s12966-020-00971-2

Funahashi, Y., Yoshino, Y., Yamazaki, K., Ozaki, Y., Mori, Y., Mori, T., Ochi, S., Iga, J.-I., & Ueno, S.-I. (2019). Analysis of methylation and -141C *Ins/Del* polymorphisms of the dopamine receptor D2 gene in patients with schizophrenia. *Psychiatry Research, 278,* 135–140. https://doi.org/10.1016/j.psychres.2019.06.001

Hillary, R. F., Stevenson, A. J., Cox, S. R., McCartney, D. L., Harris, S. E., Seeboth, A., Higham, J., Sproul, D., Taylor, A. M., Redmond, P., Corley, J., Pattie, A.,

Valdés Hernández, M. del C., Muñoz-Maniega, S., Bastin, M. E., Wardlaw, J. M., Horvath, S., Ritchie,C. W., Spires-Jones, T. L., … Marioni, R. E. (2019). An epigenetic predictor of death captures multimodal measures of brain health. *Molecular Psychiatry*. Advance online publication. https://doi.org/10.1038/s41380-019-0616-9

Hillemacher, T., Frieling, H., Buchholz, V., Hussein, R., Bleich, S., Meyer, C., John, U., Bischof, A., & Rumpf, H.-J. (2015). Alterations in DNA-methylation of the dopamine-receptor 2 gene are associated with abstinence and health care utilization in individuals with a lifetime history of pathologic gambling. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 63,* 30–34. https://doi.org/10.1016/j.pnpbp.2015.05.013

Hillemacher, T., Rhein, M., Burkert, A., Heberlein, A., Wilhelm, J., Glahn, A., Muschler, M. A. N., Kahl, K. G., Kornhuber, J., Bleich, S., & Frieling, H. (2019). DNA-methylation of the dopamin receptor 2 gene is altered during alcohol withdrawal. *European Neuropsychopharmacology, 29*(11), 1250–1257. https://doi.org/10.1016/j.euroneuro.2019.09.002

Horvath, S. (2013). DNA methylation age of human tissues and cell types. *Genome Biology, 14*(10), Article R115. https://doi.org/10.1186/gb-2013-14-10-r115

Horvath, S., & Raj, K. (2018). DNA methylation-based biomarkers and the epigenetic clock theory of ageing. *Nature Reviews Genetics, 19*(6), 371–384. https://doi.org/10.1038/s41576-018-0004-3

Horvath, S., & Ritz, B. R. (2015). Increased epigenetic age and granulocyte counts in the blood of Parkinson's disease patients. *Aging, 7*(12), 1130–1142. https://doi.org/10.18632/aging.100859

Jonasson, L. S., Nyberg, L., Kramer, A. F., Lundquist, A., Riklund, K., & Boraxbekk, C.-J. (2016). Aerobic exercise intervention, cognitive performance, and brain structure: Results from the Physical Influences on Brain in Aging (PHIBRA) Study. *Frontiers in Aging Neuroscience, 8,* Article 336. https://doi.org/10.3389/fnagi.2016.00336

Jones, M. J., Goodman, S. J., & Kobor, M. S. (2015). DNA methylation and healthy human aging. *Aging Cell, 14*(6), 924–932. https://doi.org/10.1111/acel.12349

Karalija, N., Wåhlin, A., Ek, J., Rieckmann, A., Papenberg, G., Salami, A., Brandmaier, A. M., Köhncke, Y., Johansson, J., Andersson, M., Axelsson, J., Orädd, G., Riklund, K., Lövdén, M., Lindenberger, U., Bäckman, L., & Nyberg, L. (2019). Cardiovascular factors are related to dopamine integrity and cognition in aging. *Annals of Clinical and Translational Neurology, 6*(11), 2291–2303. https://doi.org/10.1002/acn3.50927

Karrer, T. M., Josef, A. K., Mata, R., Morris, E. D., & Samanez-Larkin, G. R. (2017). Reduced dopamine receptors and transporters but not synthesis capacity in normal aging adults: A meta-analysis. *Neurobiology of Aging, 57,* 36–46. https://doi.org/10.1016/j.neurobiolaging.2017.05.006

Köhncke, Y., Laukka, E. J., Brehmer, Y., Kalpouzos, G., Li, T.-Q., Fratiglioni, L., Bäckman, L., & Lövdén, M. (2016). Three-year changes in leisure activities are associated with concurrent changes in white matter microstructure and perceptual speed in individuals aged 80 years and older. *Neurobiology of Aging, 41,* 173–186. https://doi.org/10.1016/j.neurobiolaging.2016.02.013

Lewis, C. R., Henderson-Smith, A., Breitenstein, R. S., Sowards, H. A., Piras, I. S., Huentelman, M. J., Doane, L. D., & Lemery-Chalfant, K. (2019). Dopaminergic gene methylation is associated with cognitive performance in a childhood monozygotic twin study. *Epigenetics, 14*(3), 310–323. https://doi.org/10.1080/15592294.2019.1583032

Nevalainen, N., Riklund, K., Andersson, M., Axelsson, J., Ögren, M., Lövdén, M., Lindenberger, U., Bäckman, L., & Nyberg, L. (2015). COBRA: A prospective multimodal imaging study of dopamine, brain structure and function, and cognition. *Brain Research, 1612,* 83–103. https://doi.org/10.1016/j.brainres.2014.09.010

Nikolova, Y. S., & Hariri, A. R. (2015). Can we observe epigenetic effects on human brain function? *Trends in Cognitive Sciences, 19*(7), 366–373. https://doi.org/10.1016/j.tics.2015.05.003

Plomin, R., & Deary, I. (2014). Genetics and intelligence differences: Five special findings. *Molecular Psychiatry, 20,* 98–108. https://doi.org/10.1038/mp.2014.105

Quach, A., Levine, M. E., Tanaka, T., Lu, A. T., Chen, B. H., Ferrucci, L., Ritz, B., Bandinelli, S., Neuhouser, M. L., Beasley, J. M. , Snetselaar, L., Wallace, R. B., Tsao, P. S., Absher, D., Assimes, T. L., Stewart, J. D., Li, Y., Hou, L., Baccarelli, A. A, … Horvath, S. (2017). Epigenetic clock analysis of diet, exercise, education, and lifestyle factors. *Aging, 9*(2), 419–446. https://doi.org/10.18632/aging.101168

Ramos-Lopez, O., Riezu-Boj, J. I., Milagro, F. I., & Martinez, J. A. (2018). Dopamine gene methylation patterns are associated with obesity markers and carbohydrate intake. *Brain and Behavior,* 8(8), Article e01017. https://doi.org/10.1002/brb3.1017

Rieckmann, A., Hedden, T., Younger, A. P., Sperling, R. A., Johnson, K. A., & Buckner, R. L. (2016). Dopamine transporter availability in clinically normal aging is associated with individual differences in white matter integrity. *Human Brain Mapping, 37*(2), 621–631. https://doi.org/10.1002/hbm.23054

Robertson, C. L., Ishibashi, K., Chudzynski, J., Mooney, L. J., Rawson, R. A., Dolezal, B. A., Cooper, C. B., Brown, A. K., Mandelkern, M. A., & London, E. D. (2015). Effect of exercise training on striatal dopamine D2/D3 receptors in methamphetamine users during behavioral treatment. *Neuropsychopharmacology, 41*(6), 1629–1636. https://doi.org/10.1038/npp.2015.331

Ruegsegger, G. N., & Booth, F. W. (2017). Running from disease: Molecular mechanisms associating dopamine and leptin signaling in the brain with physical inactivity, obesity, and type 2 diabetes. *Frontiers in Endocrinology, 8,* Article 109. https://doi.org/10.3389/fendo.2017.00109

Talens, R. P., Christensen, K., Putter, H., Willemsen, G., Christiansen, L., Kremer, D., Suchiman, H. E. D., Slagboom, P. E., Boomsma, D. I., & Heijmans, B. T. (2012). Epigenetic variation during the adult lifespan: Cross-sectional and longitudinal data on monozygotic twin pairs. *Aging Cell, 11*(4), 694–703. https://doi.org/10.1111/j.1474-9726.2012.00835.x

Vucetic, Z., Kimmel, J., Totoki, K., Hollenbeck, E., & Reyes, T. M. (2010). Maternal high-fat diet alters methylation and gene expression of dopamine and opioid-related genes. *Endocrinology, 151*(10), 4756–4764. https://doi.org/10.1210/en.2010-0505

Yoshino, Y., Kawabe, K., Mori, T., Mori, Y., Yamazaki, K., Numata, S., Nakata, S., Yoshida, T., Iga, J.-I., Ohmori, T., & Ueno, S.-I. (2016). Low methylation rates of dopamine receptor D2 gene promoter sites in Japanese schizophrenia subjects. *World Journal of Biological Psychiatry, 17*(6), 449–456. https://doi.org/10.1080/15622975.2016.1197424

Aula Medica, Campus Solna.

Photo: Ulf Sirborn

Life After LIFE as a Postdoc at KU Leuven in Belgium

Janne Adolf, MPIB alumna, now Postdoc, Research Group of Quantitative Psychology and Individual Differences, KU Leuven, Belgium

janne.adolf@kuleuven.be

At the end of 2016, I accepted a postdoctoral position at the university of Leuven in Belgium. From a professional perspective, it seemed natural to go: The projects envisioned for the position would allow me to build on my doctoral research on dynamic conceptualizations and modeling of affective functioning. Also, the Research Group of Quantitative Psychology and Individual Differences at KU Leuven had quite a reputation in the field, and first connections with the Intraindividual Behavioral Dynamics group at the Max Planck Institute for Human Development in Berlin, where I worked on my PhD while being a LIFE fellow, had already been established.

From a personal perspective, however, I had some reservations. Mainly about leaving Berlin, which had been my home for the previous decade, but also about moving to a rather small city: While Leuven has about 100,000 inhabitants, Berlin counts around 3.6 million and is approximately 15 times as large in terms of square kilometers. As a specific episode that fueled this concern, I recall how a former colleague and LIFE fellow, who had spent some time in Leuven himself, sent me a link to an online map of the city. But it was not a regular map; he had used an application to overlay the city map with a map of Tempelhofer Feld, the former inner city airport, location of the famous Berlin Airlift during the late 1940s. Since Tempelhof Airport closed its doors in 2008, the airfield has been used as a recreational and social space. I liked being there, taking walks with friends, enjoying the wide green area in the midst of the city. I also used to cross the airfield when cycling to MPIB. But the fact that Leuven — whose inner city also has a round shape due to the medieval city walls — only just reached beyond the outline of the airfield (see Figure 1) left me not exactly amused.

Now it has been three and a half years since I eventually moved. My cycling route to work has indeed shrunk substantially, from 13 to 2 kilometers, but I do not mind the size of Leuven at all. On the contrary, I like living in this compact and restful place where everything can be reached quickly by bike and yet you can easily lose yourself in intertwined and picturesque streets (Figure 2); where you accidentally meet acquaintanc-

Figure 1. Leuven and the outline of Tempelhofer Feld in a sobering comparison.

Source: http://www.mapfrappe.com/legacy.html?show=61113

Figure 2. The Groot Begijnhof is one of the two medieval beguinages preserved in Leuven. It belongs to KU Leuven and students, staff, and visiting scientists can apply for housing.

Photo: Janne Adolf.

Photo: Janne Adolf

Figure 3. The Dode Beemde, a nature reserve close to Leuven, invites for a walk.

es, where traditional local shops and businesses persist, and where forest and fields are in the direct neighborhood (Figure 3). The quick access to the countryside has proven particularly valuable during the critical phases of the pandemic, when working from home was required. In terms of urban integration, Leuven is obviously no longer the medieval city enclosed in defensive walls it used to be. In fact, there are rather close connections to surrounding cities, as the region is among the more densely populated areas in the world. Belgium's capital Brussels, for instance, is only half an hour away by train (Figure 4). That also makes it feel far less small.

But before I share more of my impressions of Leuven and Belgium, I would like to give you a bit of background on the Quantitative Psychology group at KU Leuven. The group conducts research at the intersection of advanced statistical and computational methods (e.g., Adolf et al., 2021; Bodner et al., 2020; Cabrieto et al., 2018; Mestdagh et al., 2019; Sies & Van Mechelen, 2020; Verdonck et al., 2021) and affective functioning and theory (e.g., Brose et al., 2015; Erbas et al., 2018; Kuppens & Verduyn, 2015; Moors & Fischer, 2019). This also includes critical methodological reflections on the quickly growing popularity of affective dynamics (e.g., Bulteel et al., 2018; Dejonckheere et al., 2019). And there is an increasing emphasis on topics of meta-science (e.g., Artner et al., 2020; Steegen et al., 2016) and software applications that support the design of intensive longitudinal studies (e.g., Lafit et al., 2021; Meers et al., 2020).

Figure 4. Brussels is certainly worth visiting. Especially when the Royal Greenhouses of Laeken open their doors for visitors, which only happens for a few weeks each year. But Leuven also has a pleasant botanical garden.

Photo: Janne Adolf

What is quite remarkable about the group in my view is its interconnectedness: It clusters into smaller work units centered around the six professors, but these units interact frequently and shared projects in varying constellations are rather the rule than the exception. The group thereby capitalizes maximally on the diverse professional backgrounds that its members bring to the table. Among the preconditions of the just-described culture are flat hierarchies and the close personal relationships between the faculty members, who sometimes have built their entire research careers together, as part of the very same group.

Members of KU Leuven also have access to a rich research and training infrastructure. This concerns for instance the Flanders Training Network for Methodology and Statistics, which offers opportunities for further qualification, often free of charge. Also, workshops supporting career development and grant applications are regularly organized by the university. And KU Leuven is part of the Interuniversity Graduate School of Psychometrics and Sociometrics, which holds biannual conferences at the different academic sites involved. It is also via these conferences that one gets in touch with a very active and networked time series modeling community in Belgium and the Netherlands. On the leisure side of things, slowly starting again as pandemic measures are relaxed, the group regularly meets for a drink, there are informal events organized by faculty members (quizzes are quite popular), there are student activities, sport courses and the university's music ensembles, which I enjoy as a member of the KU Leuven big band.

If you think this sounds all too rosy, then let me tell you that it still took me quite a while to fully transition into the new work environment. I also still had to learn a lot, including communication and coordination skills and grant writing (for a bit of an ironic characterization of that activity, see Figure 5). The latter has been an intense experience — I think I have (co-)written four grant applications in the meantime — but it is also among the reasons I am still here and will be for some more time. Having said this, I should also mention that I'm especially grateful to the German Research Foundation and the German Academic Exchange Service for having funded my work in the past two and a half years.

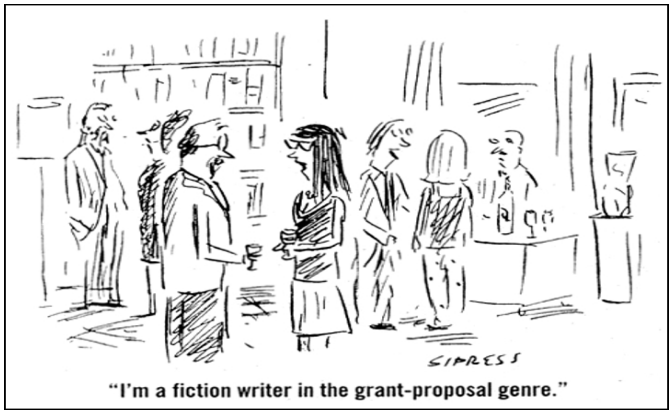

Figure 5. David Sipress' take on grant proposal writing.

Now, what to say about Belgium? What might come to mind first is the "stereotypical trinity" of fries, beer, and chocolate. Sounds pretty ordinary, you think? Not at all!

Fries — don't you dare call them French fries! — are a serious thing in this country. In fact, they are listed as an instance of Flanders' immaterial cultural heritage. Or rather the "frietkotcultuur" is. A "frietkot" or "friterie" is the place where you buy your double-baked(!) fries. Often it is just a shack as the Dutch word "kot" suggests. Once you have entered, you can typically also choose among a large number of sauces, ranging from exotic variants with peanuts to the more rustic beef stew sauce, and among various snacks. These are mostly meat-derived products with supernatural colors and funny names. My personal advice would be to never order a big portion of fries, unless you haven't eaten in a week or so. Of course not everyone in Belgium eats fries all the time, but you regularly get to observe considerable queues in front of the local "frietkot".

Obviously, fries go well with beer, which brings me to the second Belgian icon. Now, Belgian beer culture has even made it to the UNESCO Intangible Cultural Heritage list (see https://ich.unesco.org/en/RL/beer-culture-in-belgium-01062) — and for a reason. There are so many varieties that one can only rub one's eyes in astonishment. This holds especially if one is used to German beer culture, which seems to take the exact opposite stance: According to the German "Reinheitsgebot," an imperative that is also reflected in laws, (actual) beer should consist of merely a few ingredients, namely malt, hops, yeast, and water. In Belgium you can find beers that are fermented with fresh fruit (e.g., sour cherries) or various spices, and that often contain added sugar, leading to relatively high percentages of alcohol and in

consequence the occasional hangover. A number of beers, the so-called Trappist beers, have been brewed exclusively in local monasteries and can be hard to get. Another tradition is to rely on spontaneous fermentation, meaning that no yeast is added and resulting in sour beers, which are then bottled like champagne. The beer that might be best-known internationally is Stella Artois, originally brewed in — surprise! — Leuven, but the brand has in the meantime been bought by a big multinational.

Finally, Belgian chocolate can be plain and simple, but also come in the form of sophisticated filled pralines, which are often home-made. The chocolatiers generate most of their profit around Easter and St Nicolas' Day, when large chocolate Easter bunnies, bells, eggs, and St Nicolas figures are sold in huge amounts.

Now, Belgium is of course — you might have guessed this one — more than just beer, chocolate, and fries. Something almost as eccentric as Belgian beers is Belgian architecture (Figure 6). Art nouveau mansions, buildings in renaissance or classical style, and elegant functionalist structures from the early 20th century can thereby be contrasted with the infamous Ugly Belgian Houses, a not so serious collection of supposed architectural misdeeds due to bad taste and lacking construction regulations (https://uglybelgianhouses.tumblr.com). Although renovating houses seems to be a common hobby, Belgium has too many new buildings in general. This has led the government to recently adopt the so-called "betonstop," a regulation that aims at limiting the construction of new buildings in favor of the conversion of existing ones, to preserve unpaved surfaces.

The country also has a vibrant cultural scene, involving a number of music festivals — not only the well-known Rock Werchter — and film festivals. Here, Leuven already hosts two quite amazing ones, the International Documentary Film Festival Docville and the Leuven International Shortfilm Festival during which the (in my view) great Flemish short films play an important role. In addition, Belgians have created some very well-known icons of (popular) culture such as the saxophone (Figure 7), the comic-strip characters Tintin (Figure 8), the Smurfs, and Lucky Luke, or the pipe that we are told is none by surrealist painter René Mag-

Figure 6. Like the Groot Begijnhof (Figure 2), Arenberg Castle and the surrounding domain were donated to KU Leuven. It now hosts the engineering faculty.

Figure 7. A saxophone sculpture in Dinant, the birthplace of the instrument's inventor, Adolphe Sax (1814–1894).

Both photos: Janne Adolf

ritte (1898–1967): "Ceci n'est pas une pipe" (see https://www.lacma.org/art/exhibition/magritte-and-contemporary-art-treachery-images).

At the same time, Belgium is a country with a violent colonial past that it has only recently started to engage with (https://www.theguardian.com/world/2020/jun/12/belgium-forced-to-reckon-with-leopolds-legacy-and-its-colonial-past). Also, it is a somewhat divided country. The most obvious correlate of this is the language border, which separates the officially Dutch-speaking Flemish region in the north from the officially French-speaking Walloon region in the south. But the two major regions of Belgium differ not only in terms of official language. There are also significant economic, political, and cultural differences, which are enriching and complicating at the same time. The related tensions have also taken their toll in Leuven, when in the 1960s the university was split into two institutions, the Université Catholique de Louvain and the Katholieke Universiteit Leuven, now KU Leuven. The French-speaking university is located in the newly-built twin city of Louvain-La-Neuve, around 30 km south of Leuven.

As a personal addition on the topic of language: Although English is spoken widely and we also use it at work, I enjoy learning Flemish Dutch and use it in daily life. Flemish obviously has its own signature in written and spoken terms, but there are major communalities with the (High) Dutch spoken in the Netherlands. German is the third official language in the country, but my impression is that it is not particularly popular.

But before you start losing your patience over my random list, I should close; with some bold conclusions about the typical Belgian? I'm afraid I cannot do that as a former member of this graduate school, trained to embrace the complexities of individual human development. But I borrowed a little entertaining book from the public library that can. It holds that Belgians are homebound and family-oriented, can be distanced with strangers and rather indirect when communicating; they dream of (usually buying) their own house, like to improvise when confronted with problems and value their privacy and their freedom; also, they are modest and self-ironic, hate to talk about money and to argue, don't easily dance during concerts, and are rather disobedient when it comes to formal procedures (Vanacker & Puymbroeck, 2020). What is the truth content of such statements? Well, maybe you have to come by one day and find out yourself, because *Belgen zijn fantastisch… of wat dacht u*? [Belgians are fantastic… or what did you think?] (Beirendonck & Verbrugge, 2005).

References

Adolf, J. K., Loossens, T., Tuerlinckx, F., & Ceulemans, E. (2021). Optimal sampling rates for reliable continuous-time first-order autoregressive and vector autoregressive modeling. *Psychological Methods*. Advance online publication. https://doi.org/10.1037/met0000398

Artner, R., Verliefde, T., Steegen, S., Gomes, S., Traets, F., Tuerlinckx, F., & Vanpaemel, W. (2020). The reproducibility of statistical results in psychological research: An investigation using unpublished raw data. *Psychological Methods*. Advance online publication. https://doi.org/10.1037/met0000365

Beirendonck, L. van, & Verbrugge, L. (2005). *Belgen zijn fantastisch... Of wat dacht U?* [Belgians are fantastic…or what did you think?]. Brillant.

Bodner, N., Tuerlinckx, F., Bosmans, G., & Ceulemans, E. (2020). Accounting for auto-dependency in binary dyadic time series data: A comparison of model- and permutation-based approaches for testing pairwise associations. *British Journal of Mathematical and Statistical Psychology, 74*(S1), 86–109. https://doi.org/10.1111/bmsp.12222

Brose, A., Schmiedek, F., Koval, P., & Kuppens, P. (2015). Emotional inertia contributes to depressive symptoms beyond perseverative thinking. *Cognition and Emotion, 29*(3), 527–538. https://doi.org/10.1080/02699931.2014.916252

Bulteel, K., Mestdagh, M., Tuerlinckx, F., & Ceulemans, E. (2018). VAR(1) based models do not always outpredict AR(1) models in typical psychological applications. *Psychological Methods, 23*(4), 740–756. https://doi.org/10.1037/met0000178

Cabrieto, J., Tuerlinckx, F., Kuppens, P., Hunyadi, B., & Ceulemans, E. (2018). Testing for the presence of correlation changes in a multivariate time series: A permutation based approach. *Scientific Reports, 8,* Article 769. https://doi.org/10.1038/s41598-017-19067-2

Dejonckheere, E., Mestdagh, M., Houben, M., Rutten, I., Sels, L., Kuppens, P., & Tuerlinckx, F. (2019). Complex affect dynamics add limited information

to the prediction of psychological well-being. *Nature Human Behaviour, 3*(5), 478–491. https://doi.org/10.1038/s41562-019-0555-0

Erbas, Y., Ceulemans, E., Kalokerinos, E. K., Houben, M., Koval, P., Pe, M. L., & Kuppens, P. (2018). Why I don't always know what I'm feeling: The role of stress in within-person fluctuations in emotion differentiation. *Journal of Personality and Social Psychology, 115*(2), 179–191. https://doi.org/10.1037/pspa0000126

Kuppens, P., & Verduyn, P. (2015). Looking at emotion regulation through the window of emotion dynamics. *Psychological Inquiry, 26*(1), 72–79. https://doi.org/10.1080/1047840X.2015.960505

Lafit, G., Adolf, J. K., Dejonckheere, E., Myin-Germeys, I., Viechtbauer, W., & Ceulemans, E. (2021). Selection of the number of participants in intensive longitudinal studies: A user-friendly Shiny app and tutorial for performing power analysis in multilevel regression models that account for temporal dependencies. *Advances in Methods and Practices in Psychological Science, 4*(1). https://doi.org/10.1177/2515245920978738

Meers, K., Dejonckheere, E., Kalokerinos, E. K., Rummens, K., & Kuppens, P. (2020). mobileQ: A free user-friendly application for collecting experience sampling data. *Behavior Research Methods, 52*(4), 1510–1515. https://doi.org/10.3758/s13428-019-01330-1

Mestdagh, M., Verdonck, S., Meers, K., Loossens, T., & Tuerlinckx, F. (2019). Prepaid parameter estimation without likelihoods. *PLoS Computational Biology, 15*(9), Article e1007181. https://doi.org/10.1371/journal.pcbi.1007181

Moors, A., & Fischer, M. (2019). Demystifying the role of emotion in behaviour: Toward a goal-directed account. *Cognition and Emotion, 33*(1), 94–100. https://doi.org/10.1080/02699931.2018.1510381

Sies, A., & Van Mechelen, I. (2020). C443: A methodology to see a forest for the trees. *Journal of Classification, 37*(3), 730–753. https://doi.org/10.1007/s00357-019-09350-4

Steegen, S., Tuerlinckx, F., Gelman, A., & Vanpaemel, W. (2016). Increasing transparency through a multiverse analysis. *Perspectives on Psychological Science, 11*(5), 702–712. https://doi.org/10.1177/1745691616658637

Vanacker, L., & Puymbroeck, R. van. (2020). *Typisch Belgisch: Gedeelde gewoontes in een verdeeld land* [Typically Belgian: Common habits in a diverse country]. Borgerhoff & Lamberigts.

Verdonck, S., Loossens, T., & Philiastides, M. G. (2021). The Leaky Integrating Threshold and its impact on evidence accumulation models of choice response time (RT). *Psychological Review, 128*(2), 203–221. https://doi.org/10.1037/rev0000258

Figure 8. Intrepid young journalist Tintin and his dog Milou [Snowy in the English translation] were created by Belgian cartoonist Hergé (1907–1983).

Source: DARGAUD FILMS / Album / Universal Images Group

Announcement of

LIFE Outstanding Alumni Award 2021

The LIFE Steering Committee is pleased to announce the 2020 LIFE Outstanding Alumni Award competition. This annual award for LIFE alumni recognizing continued excellence in interdisciplinary developmental science post PhD was established to make use of the prize money LIFE received in connection with the APA Board of Educational Affairs Award to Advance Interdisciplinary Education and Training in Psychology. The LIFE Outstanding Alumni Award is focused specifically on the continued realization of the objectives of LIFE in the awardee's independent research career. The award winner will be invited to join the LIFE Spring Academy 2022 and to deliver an award lecture based on her/his research.

Eligibility Requirements

Applicants should have received their PhDs no earlier than three years ago and should not be more than 10 years beyond graduation. Criteria for selection will be the quality of publications, overall productivity, overall impact of research program, evidence of larger relevance of research, funding success, evidence of lifespan perspective, as well as quality, quantity, and outreach in mentoring.

Guidelines for Application

To apply please send Silke Schäfer <sschaefer@mpib-berlin.mpg.de> a PDF file containing the following materials by *September 17, 2021*:

- One-page synopsis of your relevant research program;
- Your CV;
- 2–3 representative publications;
- A statement about how your on-going research program, mentoring goals, and overall scholarship have been shaped by LIFE and continue to embody the goals of LIFE.

Those alumni who applied last year and continue to be eligible are encouraged to update their information and stay in the nomination pool.

For information on previous awardees, see https://www.imprs-life.mpg.de/en/life-program/outstanding-alumni-award

Virtual Spring Academy 2021: Fellows' Abstracts

In alphabetical order by author

Contact information available at https://www.imprs-life.mpg.de/people

Changes in romantic relationships during the pandemic

Esra Ascigil, UM

The World Health Organization declared COVID-19 a pandemic on March 11th, 2020. By late March, nearly half of Americans were worried about contracting the SARS-CoV-2 virus (American Psychiatric Association, 2020). Most felt that the coronavirus was having a serious impact on their day-to-day lives and feared that it would have a long-lasting impact on the economy (American Psychiatric Association, 2020). Clearly, the pandemic has been a stressful time for many people in the US, as well as around the globe. During this time, many cohabiting couples faced important changes in their relationships. For example, many couples started to work from home together, took care of their children full-time, or became isolated from social resources that could help alleviate stressors. In a 9-month longitudinal study of individuals in romantic relationships (N = 316 individuals) and romantic couples (N = 151 couples), we examine changes in stress and relationship quality from April 2020 to February 2021.

Maternal depression and adolescents' unhealthy behaviors

Laura Bechtiger, UZH

Adolescence is an important developmental period for establishing positive health behaviors such as an active lifestyle, healthy diet, regular sleep rhythms, and substance use habits. Yet, unhealthy behaviors are highly prevalent in adolescence. The family context and parental behaviors are likely an important influence on health behaviors. For example, exposure to maternal depression is a common childhood context that could influence the development of health behaviors. Mothers suffering from symptoms of depression (e.g., apathy, anhedonia) may be less likely to engage in health-promoting activities for themselves and their child. Though some preliminary evidence suggests that maternal depression is associated with their children's health behavior, it is limited to the childhood period and mostly based on cross-sectional studies. Our study leverages a longitudinal community study (N = 215) to examine whether maternal depression in childhood (ages 2–10) and adolescence (age 15) are linked with later self-reported adolescent health behavior (i.e., physical activity, sedentary behavior, sleep, diet, and smoking at ages 16 and 17), and whether there are sex differences in these associations. Preliminary analyses suggest that maternal depression in both childhood and adolescence are associated with poorer adolescent health behavior, but links are stronger when considering more recent maternal depression (i.e., during adolescence). Associations were also stronger for female than male adolescents. Future analyses will consider depressive symptoms of the adolescents to examine whether the association between maternal depression and adolescent health behavior may be attributed to the intergenerational transmission of depression.

Generalization and mnemonic specificity in children aged 4–8

Elisa S. Buchberger, MPIB

An adaptive memory system is caught in a fundamental tension: extracting commonalities from similar experiences to generate novel inference (i.e., generalization), while at the same time forming separate representations of similar events to circumvent interference (i.e., episodic specificity). Modern theories of memory postulate differentiable computational processes supporting these mnemonic functions, namely pattern separation, pattern completion and generalization. These processes show tremendous age-related improvements over the course of early to middle childhood, presumably influenced by maturational processes in the hippocampus and the prefrontal cortex. Evidence from adults suggests an inter-dependence between mnemonic component processes, but whether the associations between these processes exist in childhood remains largely unknown. Therefore, we set out to chart the developmental profiles of generalization and

mnemonic specificity in tandem and characterize their inter-independence in children aged four to eight. In this study, we will test 100 healthy children in the age range of four to eight on a behavioral paradigm that assesses generalization and mnemonic specificity in tandem. The task consists of an encoding phase, in which children watch a series of characters, each paired with a set of objects and scenes from a specific semantic category (e.g., musical instruments). Subsequently, participants are tested on (i) generalization (ii) context binding, (iii) item conceptual specificity, and (iv) item perceptual specificity. Due to the ongoing pandemic, a portion of the sample will be tested via a remote online-testing format. We predict that even children in the youngest age group (4 years) will perform above chance level on the generalization task. We further predict a significant age effect on both the generalization and the specificity tasks. Moreover, we predict that generalization success will not be dependent on memories for individual episodes, particularly in younger children (ages 4 and 5). Findings from this study will lay the groundwork for a longitudinal study, which will examine the link between the maturation of the hippocampal subfields, as well as the prefrontal cortex, and the development of generalization and mnemonic specificity from early to mid-childhood.

Investigating the link between life goals and personality over time

Laura Buchinger, DIW Berlin

Goals have been referred to as the contextual expression of personality (Little, 1989) or "the building blocks of personality" (Freund & Riediger, 2006, p. 353). Thus, the conceptual link between personality and goals is anything but new. It has, however, received relatively little research attention (Roberts & Robins, 2000). Notable exceptions found associations between life goal changes and personality trait changes (Atherton, Grijalva, Roberts, & Robins, 2020) but different mean-level trajectories over time (Roberts et al. 2004). Moreover, previous findings identified effects in both directions, suggesting a reciprocal interplay between life goals and traits (Bleidorn et al., 2010). If goals, however, "build" personality, changes in the former should predict changes in the latter. To further investigate this link, studies with larger sample sizes, covering longer study periods are needed. The current study fills this gap by investigating the dynamic co-development of life goals and the Big Five personality traits in a large, diverse sample. The study uses data from eight waves of the German Socio-Economic Panel Study (SOEP) covering a 13-year period.

Using dynamic exploratory graph analysis to study the changing structure of emotion regulation in daily life

Katharine E. Daniel, UVA

There are many emotion regulation strategies that contribute to physical and psychological health outcomes, as well as to relationship quality. Researchers have recently put effort into testing how different emotion regulation strategies relate to one another in order to better synthesize strategy-specific findings across the literature. However, there has been little work testing how relationships among emotion regulation strategies change across different contexts, despite the prominence of theories that suggest successful emotion regulation requires implementing strategies that meet the changing demands of daily life. We used dynamic exploratory graph analysis to examine the structure of 19 different emotion regulation strategies within a sample of $N = 114$ high trait socially anxious individuals who completed a 5-week ecological momentary assessment study. We then tested how this emotion regulation structure changed after adding three contextual features into the network: being at home versus elsewhere, being alone versus with others, and experiencing more or less negative affect than one's mean level. Across the full sample, the context-free structure uncovered three dynamical factors of strategies that tended to change together over time: cognitive strategies, behavioral strategies, and escape-related strategies. However, the number of dynamical factors and the specific strategies that composed each dynamical factor changed in different ways when including home and affect contextual information in the network, but not when including social context. This study shows that the dynamic structure of emotion regulation strategy use in daily life shifts across locations and emotional states. These results suggest that, when synthesizing findings across the literature, it is important to consider the contexts in which strategy use was reported.

Emotion regulation strategy use and socioemotional well-being in young adults, mothers and children during the first year of Covid-19: Behavioral and neural correlates
Plamina Dimanova, UZH

The global onset of the COVID-19 pandemic impacted individuals' healthy social and psychological functioning by inducing stressful experiences and thus triggering strong emotional responses. The successful employment of adaptive emotion regulation strategies provides a cognitive skill set supporting one's perception of and reaction to stressful situations enabling the downregulation of negative emotions. However, maladaptive strategies such as rumination or suppression are suggested to deteriorate mental health and contribute to an increase of anxiety and depression levels. Corticolimbic structures, e.g., dorsolateral prefrontal cortex and amygdala, are supporting emotion regulation mechanisms and alterations of these are associated with behavioral dysfunctions. In 69 participants (43 adults, 31 females; average age = 35.14/range 22–51years; 26 children; 10 females; average age=10.69/range 7–17 years) individual variation of well-being was studied across six timepoints in the first three months after the COVID-19 outbreak in Switzerland and one additional assessment at the end of 2020. The association between emotion regulation strategy use and well-being was examined. Furthermore, mediation analyses were employed to investigate the role of pre-pandemic brain measures of the emotion regulation network on individuals' mental health. Significant differences in anxiety levels across assessment points were observed. Anxiety and depression levels in adults during early timepoints and the end of the year were predicted by adaptive and maladaptive strategy use. Rumination, in particular, mediated the association between prepandemic structural brain markers and well-being. These findings suggest a possibility for early identification of risk factors for mental health dysfunctions and emphasize the potential of intervention strategies targeting emotion regulation skills.

How to use the internet to alleviate loneliness in older adults: A clinical psychological perspective
Christine Dworschak, UZH

Globally, the number of older adults is constantly increasing. This growth has been accompanied by evidence of increased loneliness in this age group. There is also rising concern that recommended social restrictions during the COVID-19 pandemic may increase feelings of loneliness, particularly among vulnerable groups. Despite the negative impact of loneliness on older adults' well-being, only a small proportion of older adults seeks or receives appropriate psychological support (e.g., due to mobility restrictions, fear of stigmatization). Internet-based psychological interventions could offer a new treatment approach. In this presentation, I would like to give a short overview on my dissertation project on e-mental health and loneliness, including findings of a systematic review on the effectiveness of internet-based psychological interventions in older adults as well as the development of an internet-based treatment for alleviating loneliness in older adults.

Long-term associates of child maltreatment: Lifetime post-traumatic stress disorder, social acknowledgement and stressful life events
Carla Eising, UZH

Child maltreatment (CM) is known to affect mental health, including the development of post-traumatic stress disorder (PTSD). An emerging study group of interest in this context are individuals affected by child-welfare care (i.e., children taken into care by a welfare institution). There is much to suggest that that individuals affected by such care are more prone to experience more severe, longer lasting and more diverse forms of CM and might experience more stressful life events following welfare-care. So far there is a lack of studies investigating multivariate forms of welfare care in Switzerland (besides forced child labor) and its very long-term associations into older age. The present study examined the link between CM and PTSD as well as its associations with stressful life events and social acknowledgement (i.e., the degree to which an individual feels validated and supported following a traumatic event). We studied n = 116 individuals taken into care in their childhood and/or adolescence (risk group = RG; M_{age} = 70.25 years, 41% female) and an age-matched control group (CG; n = 122 , M_{age} = 70.71 years, 51% female). Results (self-report questionnaires and a clinical interview) showed that individuals in the RG reported significantly more and higher exposure to CM as well as more stressful life events over the life course. Fur-

thermore, exposure to CM, and not a history of welfare care, was associated with PTSD. The link between CM and PTSD was further mediated by social acknowledgment in individuals of the CG, who also reported higher levels of social acknowledgement. The findings demonstrate that safeguarding measures should be taken to protect children's well-being and that individuals affected by CM may greatly benefit from social acknowledgment in the aftermath of CM.

Working memory for emotion predicts real-world affective forecasting accuracy
Colleen Frank, UM

A crucial aspect of optimal decision making is predicting how different outcomes will make us feel (i.e., affective forecasting). A recent study found that variability in working memory for emotion (i.e., affective working memory) predicts individual differences in the accuracy of these forecasts. In the present work, we examined whether this relationship, previously tested using emotionally evocative photographs, would replicate and generalize to forecasted feelings to a real-world event (i.e., the 2020 US election). Across both forecasting measures, we find that the ability to maintain emotional experiences predicts forecasting accuracy such that better affective working memory abilities are related to more accurate predictions. However, the ability to maintain non-affective (i.e., perceptual) information did not explain individual differences in forecasting. These findings provide a better understanding of the mechanistic underpinnings of forecasting accuracy, and further support the idea that affective working memory is a core psychological process underlying emotional prospection.

The accuracy of people's confidence in discerning true from false news
Michael Geers, MPIB

False news can harm science, society, and democracy, with false content diffusing faster and more deeply on social networks than (some) true news. While discerning truth from falsehood online is fundamental, people's confidence in their truth judgments crucially influences how likely they are to act on and defend their beliefs. Here we assess the accuracy of confidence in discerning true from false news headlines in an online US sample (N = 157; Prolific). In a first study, we presented participants with 24 news headlines as they would appear on a Facebook news feed (i.e., image, headline, and source); 12 were accurate and 12 were inaccurate. For each headline, respondents evaluated the accuracy of the headline (accurate vs. inaccurate) and how confident they are that their decision was correct (subjective probability: 50–100%). Preliminary analyses investigated participants' accuracy of confidence (AUC), that is, the extent to which their confidence discriminates between correct and wrong decisions. We find that participants showed, on average, reasonable AUC, but also strong inter-individual differences (median = 0.65, 95% CI: 0.63–0.68, middle 80%: 0.46–0.84). Moreover, participants showed lower AUC for false relative to true items, with a substantial proportion of participants falling below chance level for false items. This suggests that some participants may be led astray by incorrect confidence in false news. Implications for individual decision making and the social dissemination of information are discussed.

Understanding eyewitness verbal confidence
Jesse Grabman, UVA

Growing evidence suggests that eyewitness lineup identifications made with high numeric confidence are typically accurate (Wixted & Wells, 2017). However, unlike in the lab, police in many countries are instructed to solicit the eyewitness's confidence in an identification "in their own words", rather than using a numeric rating scale. Decades of research show that people tend to prefer expressing confidence verbally (e.g., "I'm very confident."), rather than with numbers (e.g., "I'm 80% confident."). Our research seeks to address two questions:

1. Are verbal confidence statements predictive of eyewitnesses' identification accuracy?
2. Is the information gained from verbal confidence statements the same as from numeric confidence?

In our study, 569 mock witnesses encoded 12 faces, and then completed 12 eyewitness lineups. Participants provided both numeric and verbal confidence following each lineup decision. Results from a 'bag-of-words' language classifier showed that verbal confidence statements were strongly predictive of identification accuracy. Interestingly, mixed-effects analyses demonstrated that verbal confidence statements contributed

to the prediction of identification accuracy above and beyond traditional measures, such as numeric confidence and response time. These results open avenues for both future theoretical (e.g., the basis of verbal vs. numeric confidence) and applied (e.g., how police solicit confidence) research.

Motor sequence learning in children and adults
Maike Hille, MPIB

The acquisition of motor skills involves a number of brain areas, including prefrontal cortex, primary motor cortex and supplementary motor area. These regions vary considerably in their maturational processes. Frontal regions which are particularly involved early in learning when cognitive control demands are higher than in later learning phases, mature relatively late in childhood. In contrast, primary motor regions, that are more prominently engaged during later learning, mature relatively early. However, little is known about differences in the engagement of these regions during motor sequence learning between children and adults. In order to address the question to what extent the maturational differences across brain regions affect differences in motor learning across development, the present study investigated motor sequence learning in children (7–10 years, $n = 39$) and young adults (20 – 32 years, $n = 39$). In an associative visuo-motor task, participants saw four squares corresponding to four response buttons; via trial and error, participants learned several four- to eight-element motor sequences by practicing them until they were performed without errors for multiple repetitions. Using functional magnetic resonance imaging, this paradigm allowed us to investigate how behavior as well as functional activity differs between children and adults during different phases of motor sequence learning.

Computationally rational strategies for integrating reinforcement learning and working memory in younger and older adults
Hyesue Jang, UM

We investigate the possibility that adult age differences in a choice learning task can be explained by adaptations to age differences in the limits ("bounds") of different components of learning and memory. Learning which choice option is most likely to lead to reward involves both conscious, effortful working memory (WM) and automatic, implicit reinforcement learning (RL) processes (Collins, 2018; Collins & Frank, 2018). WM and RL have complementary strengths and weaknesses (WM: fast/accurate but capacity-limited/delay-sensitive; RL: robust but slow). Optimal performance depends on finding the right balance between these systems, based on their relative effectiveness. WM declines more than RL with age, and thus the theoretical concept of bounded optimality (Lewis et al., 2014) predicts that older adults will rely more on RL than WM during the choice-learning task than will young adults. We will explore how a modified version of an existing computational model (Collins & Frank, 2018) might explain individual differences in the performance of young and older adults by deriving the optimal balance between these systems depending on their limitations.

Investigating the role of visual cortical inhibition in aging
Dalia Khammash, UM

The inhibitory neurotransmitter GABA (γ-aminobutyric acid) is responsible for maintaining the balance of excitation and inhibition in the brain. Deficits in GABA are associated with various motor and psychiatric disorders and may also play a role in age-related cognitive decline. However, there are limited ways of probing GABA in vivo. While magnetic resonance spectroscopy (MRS) can assess the concentration of GABA, this measure may not be indicative of local inhibitory functioning. Instead, techniques such as paired-pulse transcranial magnetic stimulation (ppTMS) are often used to probe local GABA-mediated inhibitory function. However, ppTMS is almost exclusively used in motor cortex. We therefore recently adapted this technique for use in the visual cortex. While TMS of the motor cortex elicits measurable muscle-twitches, stimulation of visual cortex elicits short-lived visual percepts called phosphenes, which can be measured using a tracing paradigm. I discuss a project in which we utilized this new method to investigate visual cortical inhibition with age. Previous studies show age-related decreases in GABA levels across several brain regions, including visual cortex. I will therefore present preliminary data that explores how MRS measures of GABA concentration relate to TMS measures of GABA-mediated inhibitory func-

tion in visual cortex. I will also present additional preliminary data that investigates whether visual cortical inhibition is reduced in older adults. The ability to assess changes in GABAergic function in more than just motor cortex is necessary to better characterize the role it plays in both disease as well as healthy aging.

Social traits moderate associations between social contact and well-being: A longitudinal study during nation-wide contact restrictions
Michael Krämer, DIW Berlin

Humans possess an innate need for social contact and closeness. Satisfaction of this need benefits well-being, whereas ongoing deprivation is detrimental. How much contact people desire is far from universal, and evidence is mixed on individual differences in the association between social contact and well-being. The current longitudinal study (N = 190) examined changes in social contact and well-being during nation-wide contact restrictions. Over the first COVID-19 lockdown, which initially constrained social contacts strictly, we analyzed how changes in personal and indirect social contact and well-being varied with extraversion, affiliation motive, need to be alone, and social anxiety. The results showed that affiliation motive, need to be alone, and social anxiety moderated the resumption of personal contact as restrictions were loosened as well as changes in wellbeing associated with increased personal and indirect contact. Our results highlight individual differences in social behavior and associated well-being during the COVID-19 pandemic.

Better off without? Resolving goal conflict by means of shelving or abandoning goals
Zita Mayer, UZH

Managing multiple goals that compete for finite resources (e.g., time) can be challenging and may result in goal conflicts, where one goal pursuit interferes with another goal pursuit. To resolve goal conflicts, people may choose to disengage from a conflicting goal. Goal disengagement involves two distinct processes: Withdrawing current behavioral goal investments and current psychological goal commitment. Alternatively, people may choose to shelve the conflicting goal with the intention to reengage in the future. Goal shelving can be thought of as a "soft form" of goal disengagement: Withdrawing current behavioral goal investments but not psychological goal commitment. Although we can assume that many adults have or will at some point in their life decide to quit or postpone some goals to focus on other goals, we know very little about the proximal antecedents and consequences of these decisions. I will present plans for an exploratory study on antecedents of shelving and disengagement decisions and will present results of an online experiment and daily diary study on proximal outcomes of goal shelving and goal disengagement.

Regularized continuous time dynamic networks
Jannik Orzek, HU

There is an increasing use of network models in research on psychopathology (Robinaugh, Hoekstra, Toner, & Borsboom, 2020). Existing longitudinal network models in this field, however, are limited by the strong assumption of equally spaced measurement occasions. In practice, this assumption is almost always violated (e.g., in experience sampling studies). The problem is aggravated by the possibly large number of variables in a network, potentially resulting in a situation where each variable for each person is observed at a different point in time. To resolve these problems, we propose regularized continuous time dynamic models. Here, the exact time point of a measurement is considered in the parameter estimation procedure. This allows for any arbitrary measurement scheme. Regularization reduces the risk of overfitting in small samples and allows for a sparse drift matrix to simplify model interpretation. Regularized continuous time dynamic models are implemented in the R (R Core Team, 2018) package regCtsem. We demonstrate the use of regCtsem in a simulation study, which shows that the proposed regularization improves the parameter estimates, especially in small samples. The approach correctly identifies true-zero parameters while retaining true-nonzero parameters. We present an empirical example and end with a discussion on current limitations and future research directions.

Age differences in category specificity during memory recognition

Claire Pauley, MPIB

Neural dedifferentiation, the finding that neural representations become less distinctive with advancing age, is commonly implicated in age-related memory decline. To date, most studies have investigated neural dedifferentiation in terms of the specificity with which information is encoded, but few with regard to the specificity of retrieved information. Initial evidence indicates that neural representations during memory retrieval may reveal a greater and more widespread impact of neural dedifferentiation than representations during encoding. Thus, in an age-comparative fMRI study, we examined how neural dedifferentiation manifests during recognition. Thirty-four younger (18–27 years) and 32 older adults (65–75 years) performed an incidental encoding task with face and house images and subsequently completed a surprise old/new recognition memory test. Using a searchlight approach with representational similarity analysis (RSA), we identified brain regions in which the similarity of stimuli from the same category (i.e., face-face) was greater than the similarity of stimuli between categories (i.e., face-house) during recognition. This analysis revealed a bilateral area of the ventral visual cortex showing high category specificity in all participants. No age differences in category specificity were identified in this region. However, a searchlight analysis targeting age differences in category specificity found younger adults to have greater category specificity than older adults in the right fusiform gyrus, parahippocampus, and hippocampus. Furthermore, older adults had greater category specificity than younger adults in the right lingual gyrus and calcarine cortex. However, category specificity did not correlate with memory performance in any of the regions identified. Thus, we established evidence for both neural dedifferentiation as well as hyperdifferentiation in older adults during memory recognition. However, we were unable to establish a relationship between category specificity and memory performance, leaving open the question of how these age-related differences relate to memory. Overall, our findings may indicate an age-related neural shift in regions responsible for processing category-selective information during recognition.

Measuring changes in latent structural integrity of the brain over the course of an exercise intervention in older adults

Sarah Polk, MPIB

Studies investigating the effects of aerobic exercise on the aging brain have generally used tools such as volumetric analysis to measure changes in brain structure. For example, voxel-based morphometry (VBM) has been used to investigate macroscopic changes in gray matter density due to aerobic exercise. However, exercise could also have an impact on the brain's microstructure, including effects on myelination and white matter coherence. In this study, we adopted recently developed multi-modal methods that compute a latent factor that incorporates both macro- and microstructural measures of brain integrity, using estimations from three different imaging modalities as indicators: gray matter probability, magnetization transfer (proxy of myelination), and mean diffusivity (proxy of white matter coherence), in order to study the effects of exercise on overall structural integrity of aging brains. In this way, we measured change in integrity during a six-month exercise intervention in regions of interest previously reported in studies using volumetric approaches. Seventy-five healthy, previously sedentary older adults (63–76 years old) completed an at-home intervention study either in an exercise group ($n = 40$) or in an active control group ($n = 35$). Exercisers showed gains in cardiovascular fitness (VO_2max) over controls. We successfully established reliable latent change score models of structural integrity; notably, the right anterior cingulate cortex (rACC) showed significant inter-individual difference in change, as well as significant group differences in mean change with maintenance in the exercise group. Finally, change in VO_2max was positively correlated with change in rACC integrity overall and within the exercise group, but not within the active control group. In summary, the exercise group benefited from aerobic exercise in terms of cardiovascular fitness and gray matter integrity in the rACC, a region that has repeatedly shown exercise-related changes, and those exercisers who gained more fitness during the intervention also decreased less in rACC integrity.

An observational approach to examining white parents' racial-ethnic socialization practices with adolescent youth
Shannon Savell, UVA

Continued acts of police brutality and violence underscore the fallacy of a post-racial America. Recent research suggests that Black adolescents experience an average of five instances of racial discrimination daily (English & Sellers, 2020), painting a bleak picture of the extent to which anti-Blackness is woven into societal fabric. To equip children with the skills and confidence to navigate and challenge anti-Black racism, many Black parents use racial socialization (RS) strategies—or verbal and nonverbal messages and practices about racial issues. Extant research has generally found that RS can mitigate the detrimental effects of discrimination on youth adjustment highlighting RS as a culturally specific asset in Black families. Although emerging intervention research focused on strengthening Black parents' RS competency is exciting and needed, these efforts must be paralleled by a commitment to providing White youth with the skills to navigate racial conversations, and identify and challenge racial discrimination. While past studies have focused on aspects of RS most relevant to Black families, all parents, regardless of their race, communicate messages about race to their children through indirect and direct processes. However, as RS is frequently assumed to be a phenomenon specific to racial-ethnic minority families, little is known about the ways in which White parents communicate (or fail to communicate) with their children about racial topics. Drawing on a sample of 249 White caregiver–adolescent dyads recruited from urban, suburban, and rural sites, this paper seeks to advance our understanding of the RS practices used in White families. Results will focus on the frequency and content of parents' RS messages during an observed parent–child discussion task about discrimination at age 14. Our coding system has captured various facets of parents' RS practices, including egalitarianism/colorblind attitudes, discouraging cross-cultural friendships, and discriminatory attitudes. All videos have been coded and inter-rater reliability suggests consistency between coders was obtained. Ultimately, racial socialization within White families that is actively anti-racist may be one of the most effective long-term means of reducing racial discrimination. Understanding current RS practices in White families is a necessary component for understanding racism, with the potential to inform targets of prevention and intervention.

Is it work or leisure? Investigating the role of cues in online vignette experiments
Victoria Schüttengruber, UZH

Building on a process model on the effects of subjective expectations about exhaustion and recovery, we investigated the relative importance of the various cues for the categorization of activities as belonging more to the life-domain of work or leisure. The cues were: autonomy, location, goal, time of day, and social partner. In two online experiments, we varied the cues and combined them with everyday activities. Participants rated the degree of work, leisure, or other life domains, and indicators of exhaustion and recovery identified in previous research. Study 1 employed a 2 (autonomy: high vs. low) x 2 (location: work vs. non-work) x 2 (goal: work vs. leisure) x 2 (time of day: work vs. non-work hours) x 3 (social partner: alone vs. work vs. non-work) mixed design to create 592 vignettes using 17 activities. Each participant (N = 1106) rated 8 randomly drawn vignettes. Multilevel analyses identified the goal of activities, the degree of autonomy, and the location as the most impactful cues for the categorization of activities as belonging to work or leisure. Study 2 adopted a 2 (autonomy: high vs. low) x 2 (location: work vs. non-work) x 2 (goal: work vs. leisure) mixed design to generate 128 vignettes based on 16 activities. Each participant (N = 798) rated a set of 16 vignettes that included each cue combination twice. Again, participants mainly relied on the cue of the goal of the activity for their categorizations. Findings provide first empirical support for the cues and the expectations about exhaustion and recovery conceptualized in the process model.

Variability in mental computations underlying decision making and its relevance for aging
Alexander Skowron, MPIB

Normative models of learning and decision making under uncertainty prescribe how people should combine new pieces of information to arrive at optimal conclusions. Deviations from such optimal processing observed empirically may

stem from systematic (e.g., heuristics and biases) or stochastic sources (e.g., approximate Bayesian inference). With respect to aging, most of the differences reported in the literature have been attributed to the former source. However, recent evidence in healthy young adults suggests that variability in mental computations may contribute to suboptimal behavior. Notably, this deviation from optimality may actually be adaptive in complex environments, where exact inference would be computationally costly. I propose that this variability in decision-making computations also changes with age. This is in line with theories arguing that the variability of neural processes changes over the lifespan. In my talk I will firstly present updated findings on a project looking into age differences in inferential variability during reinforcement learning and its neural substrates. In the second part of my talk, I will present a novel paradigm to investigate how people adapt the precision of mental computations given different environmental demands. This paradigm is part of a planned online study to investigate age differences in the modulation of inferential precision.

Optimizing design sensitivity in randomized trials on student achievement: Which covariates are most effective?
Sophie E. Stallasch, University of Potsdam

The inclusion of strong covariates is a highly promising strategy to boost power and precision in randomized trials on student achievement. Yet, systematic empirical guidance on covariate selection is scarce. Adopting a psychometric perspective, validity in the prediction of a specific outcome (e.g., science achievement) may be maximized by covariates that (i) are specific and narrow rather than broad (e.g., prior science achievement vs. prior reading achievement vs. intelligence; specificity matching/bandwidth fidelity), (ii) have a short rather than long time lag to the outcome (e.g., prior achievement 1 vs. 3 years ago; validity degradation), and (iii) add to the prediction over and above other covariates (e.g., prior science achievement plus sociodemographic characteristics; incremental validity). So far, the respective debates are predominated by research based on single-level (i.e., not hierarchically clustered) data. It is therefore unclear whether these psychometric principles generalize to more complex multilevel designs involving cluster randomization (of, e.g., entire schools). Capitalizing on representative data of 1st to 12th graders from two longitudinal German large-scale assessments ($1868 \leq N \leq 6731$), we fitted single- and multilevel latent covariate models to rigorously analyze the impact of a broad array of covariate sets with varying (i) specificities, (ii) time lags, and (iii) combinations on the design sensitivity in individually- and cluster-randomized trials for several achievement outcomes. Findings demonstrate that while the psychometric principles largely apply well in single-level designs, outcome-covariate relations tend to be more undifferentiated in multilevel designs. We illustrate practical implications for the design of randomized trials.

Where to go for a walk? Neural, physiological, and behavioural correlates of a one-hour walk in natural vs. urban environment
Sonja Sudimac, MPIB

Although living in an urban environment comes with many advantages, it is associated with an increased risk for mental health disorders such as schizophrenia, mood, and anxiety disorders. It has been demonstrated that even a brief exposure to natural environments improves mood and reduces stress. However, no study so far has examined neural mechanisms underlying the effects of exposure to urban and natural environments. To fill this gap, the first study within my dissertation focuses on the neural correlates of stress after a one-hour walk in the urban vs. natural environment. In this study, fMRI stress paradigms were utilized, in which participants were measured in the scanner, before and after the walk. As hypothesized, we found that the activity in the amygdala, a brain region related to stress processing, decreased after the nature walk, whereas it increased after the urban walk in one of the stress tasks. Additionally, higher perceived restorativeness was observed in the natural compared to the urban environment group. To account for different age groups and populations, the second study will examine the effects of exposure to natural vs. urban environments in mothers and their infants. In this study, we expect that the level of cortisol, an indicator of stress, in mothers' and infants' saliva will be lower after a one-hour walk in the natural compared to the urban environment. Additionally, cortisol from the mothers' breast milk will be measured to examine the possibility that exposure to natural and urban

environments affects the infants' levels of stress through the cortisol in the mothers' breast milk. Understanding neural and physiological mechanisms behind nature's beneficial effects aims to influence the design of physical environments in ways that will improve mental health in a rapidly developing urban world and consequently enhance citizens' well-being.

The brain in the residential space: Psychological responses to elements of architecture
Nour Tawil, MPIB

Almost 70% of our time is spent at home, reaching 100% in recurrent confinement periods of the present pandemic. While the role of built environments in shaping brain and behavior has been established, the mechanisms underlying architectural experience, particularly in domestic spaces, are largely unexplored. Building on findings of the limited research on spatial properties, this project aims to bridge this gap by investigating the psychological and neurophysiological responses to residential space's interior and exterior architecture. Using virtual reality (VR) in our first study, we examined whether exposure to indoor curved conditions (vs. angular) positively influence mood, spatial experience, working memory capacity, and implicit action tendencies. Participants freely explored five controlled virtual rooms, inside which they performed a repeated cognitive task and rated their mood and spatial experience, while physiological measures were continuously collected. An approach-avoidance task was administered post-VR. We will perform an analysis on behavioral, cognitive, and physiological data to compare contour conditions. Moreover, we will attempt to correlate behaviour in the VRs (movement and gaze) with individual differences. In a second study, we exposed participants to 50 images from the well-controlled DalHouses stimuli-set of houses facades, which we have deconstructed to identify physical properties of exterior design features. All subjects rated all images on 12 psychological dimensions. We will correlate results with specific facade properties and look into individual and cultural differences. With the lack of relevant studies, my project's goal is to identify architectural elements of beneficial qualities that optimize the domestic space in ways to enhance well-being.

Prospects and limitations of online testing with young children: Evidence from a probability learning study
Anna Thoma, MPIB

The circumstances of our times left many researchers with difficulties to continue or start data collection for their studies. While online data collection with adult participants has been a standard procedure for many years, online testing with children only recently became an attractive option for developmental scientists to keep studies running during the COVID-19 pandemic. Online testing with children has clear advantages, such as location independence of experimenter and participants. However, there may be several constraints that can impede replicability of offline studies in an online setup. In this talk, I will first present the online data collection procedure of a longitudinal study investigating the development of probability learning in early childhood. I will then compare preliminary behavioral results with those of a similar study conducted offline in a local museum. Our results suggest that children's choice behavior becomes more random over the course of the online experiment as compared to the museum study. I will conclude with discussing possible causes for this finding.

Emotion detection in text: Similarities and differences across cultures and the lifespan
Tara Valladares, UVA

Emotion detection refers to the statistical prediction and analysis of emotion in text, often through machine learning. Though it is related to sentiment analysis, it differs in several key ways. By moving away from simple positive and negative valence into different categories of emotion, there are new methodological challenges and questions about the validity of defining emotion and how it is expressed through text. As the methods and tools for emotion detection have largely been built by researchers without a background in psychology or emotion, emotion expression is often assumed to be static across time, place, and culture. While there is evidence for several basic "universal" emotions, there is also substantial evidence that emotion expression varies across cultures and the lifespan (An et al., 2017; Eid & Diener, 2001; Kunzmann et al., 2016). In this talk, I will be describing the potential unexplored

issues in the field and future research plans for their evaluation.

Loneliness and well-being in the daily lives of older couples: The role of conflict
Elisa Weber, UZH

Intimate partner relationships foster individuals' health and well-being throughout the lifespan. However, dissatisfying or conflict-laden relationships can have a detrimental impact on well-being and relationship quality. The majority of older adults live together with a spouse/partner, and intimate relationships are one of the most important social contexts in their daily lives. Expanding on previous research, we examined the role of previous conflict on experiences of loneliness and affect in the daily lives of older intimate relationship partners from a dyadic perspective. Relationship duration and quality, physical health, personality traits (neuroticism and extraversion) as well as the number of conflict episodes during the measurement period were considered as potential moderators. We used data from an experience sampling study with 151 older heterosexual couples (302 participants; 65+ years old) who reported on their positive and negative affect, loneliness, and previous experience of relationship conflict 6 times a day for 14 days. Data were analyzed using dyadic multilevel models. For both men and women within couples, previous conflict was associated with an increased experience of negative affect and loneliness and a decreased experience of positive affect. Women high in neuroticism experienced less positive and more negative affect after conflict. Higher relationship satisfaction predicted less increase in negative affect for female partners. Relationship duration, physical health, extraversion and the number of conflict episodes showed no moderating effects. Our results support the notion that relationship conflict may deteriorate emotional well-being and render individuals lonesome even in the context of intimate partner relationships.

Virtual Spring Academy 2021: Screen Shots

Screen shots: Jacqui Smith

Photo: Michelle Francisca Lee on Unsplash

Photo: Boudewijn Huysmans on Unsplash

10 Questions

Xin (Cynthia) Tong, Assistant Professor, Department of Psychology, University of Virginia

xt8b@virginia.edu

How did you get involved in the study of methods in developmental psychology?

I've been interested in longitudinal research since I took a longitudinal data analysis course in graduate school ten years ago. I have worked on many projects, aiming to improve the performance of existing longitudinal models to handle nonnormal data and missing data, or apply appropriate longitudinal models to analyze real data. With more experience in longitudinal research, I began to think profoundly about the usefulness of longitudinal research. Longitudinal studies help us understand changes. Unlike one-off cross-sectional studies which give information about subjects at one point, like a snapshot photo, longitudinal studies follow subjects across time, more like a photo album. They tell a story of subjects not only at a moment in time, but also over time, showing how subjects have changed and what factors have caused between-subjects variations in change. As pointed out in Maxwell and Cole (2007), researchers are urged to include multiple waves of data in their designs and analysis. By using longitudinal analytical techniques, causal relationships can be effectively studied, and the statistical validity can be maximized. With longitudinal data analysis as one of my research interests, I have been naturally involved in developmental psychology. Besides my methodological work that I will talk about later, I also found it fun to explore the intrinsic relationship among factors of a problem and how such relationship develops over time. It is a great pleasure to collaborate with developmental psychologists and study topics like whether children in Montessori schools grow faster in academic achievement than children in conventional schools, whether organized extracurricular activities predict school readiness outcomes during early childhood, and whether such influences are the same for different subsamples, etc. It's a great joy that the methods that I have developed can be applied in this field and are truly useful. With such joys, I let myself stay in this field and study methods here.

Could you name books or articles that have profoundly influenced your own thinking about methodology in the field of psychology?

There are more than just a few books and articles that have profoundly influenced my own thinking about methodology in the field. And popular methodology in psychology is not static. I can easily recommend several books and articles if someone wants to learn Bayesian methods, missing data analysis, R programming, etc. But I had a hard time pinpointing which books and articles are the best to influence the way I think because most of them serve me well in some aspect. There are certain types of books and articles that help me understand concepts. There are books and articles that help me learn how to implement an analysis. There are articles that inspire me to develop statistical methods. There are also books and articles where I learn how to structure my own paper and communicate my own study results. In fact, my own thinking about methodology is usually formed or changed when I write an article myself, or even during teaching. When I want to communicate some issue, I study it more thoroughly and generate or shape my idea more concretely. Discussions with my brilliant colleagues in the field are another great resource that influences my thinking.

Which do you consider the two main current debates within the field?

I was invited to join a virtual forum on Data Science and Methodology recently, where I was involved in a debate about whether combining psychological models with machine learning can improve predictions. While machine learning algorithms have been developed for decades, they have attained new popularity these days. Many researchers developed methods to complement the analytical workflow of psychological experiments with machine learning techniques. For example, Jacobucci, Grimm, and McArdle (2016) proposed regularized structure equation model-

ing (SEM) where specific parameters in structural equation models are penalized using ridge or lasso regressions with the goal of creating easier to understand and simpler models. Interestingly, despite the popularity of the application of machine learning in psychological research, more and more researchers are starting to question the reliability of machine learning algorithms with a limited sample size. Many papers have been published to investigate the machine learning algorithm validation for small samples. Particularly, Yuan and Liu (2021) examined the performance of lasso SEM. They concluded that when the sample size is not sufficiently large, model modification using the Lagrange multiplier test has been found not to perform well, but lasso SEM is no better than the Lagrange multiplier test either and is unable to deliver the expected promises. Although I'm working on combining some text mining models with longitudinal models right now, the recent debate regarding this issue reminds me that there are potential pitfalls resulting from the adoption of machine learning based experiment analysis. If not properly used, it can lead to inaccurate results. In general, machine learning algorithms often require a large sample and studies have implied that these modern modeling techniques should only be considered in problems if very large data sets with many events are available (e.g., van der Ploeg, Austin, & Steyerberg, 2014). In many areas of psychology, a large sample is impossible. Advances in neuroimaging, eye-tracking, and many other technology-based data collection methods have yielded high dimensional datasets, which commonly have a small number of samples because of the high cost of data collection. High dimensional data with a small number of samples can lead to biased machine learning performance estimates especially when it is built within more complicated psychological models. Substantive researchers may need to be cautious and carefully examine sample size required for their models before using machine learning.

What research topics have been neglected or have not received enough attention so far?

As a quantitative psychologist, I would say many research topics have not received enough attention. Even when quantitative researchers have pointed out problems with some conventional methods and proposed improved techniques, substantive researchers may still pick the most convenient methods. For example, although many robust methods have been proposed to handle nonnormal data, normal-distribution-based maximum likelihood is still the most used method in practice as it is available in most statistical software. The gap between quantitative and substantive researchers can be filled with quantitative trainings, better software packages, and hands-on tutorials. The preregistration revolution has also helped researchers thoroughly and deeply think about the design of their studies and analysis stategies. I'm really delighted to see that after receiving quantitative training, our graduate students now routinely examine the model assumptions before fitting any model to their data. They use the more flexible R programming and are open to learning different techniques to appropriately handle their data.

Here I want to particularly point out one topic that has been well recognized by psychological researchers, but I believe is still neglected in many situations. That is the issue of measurement unreliability. In one of my recent papers (Ke & Tong, in press), we showed that even when there is no publication bias, the current meta-analysis procedures would frequently detect nonexistent effects and provide severely biased estimates because of the improper handling of measurement unreliability. Besides meta-analysis, two-stage data analysis procedures may have this issue too. For example, in practice, sentiment analysis may be used to estimate the sentiment scores in the first stage, and these are then used in another model to study how sentiment is related to other human behaviors in the second stage. In this process, the unreliability of sentiment scores is neglected. Correcting for unreliability is necessary, and more research is needed on this topic.

One of your foci is on Bayesian growth curve modelling. Can you tell us more about this?

Sure. As I just mentioned, longitudinal data are useful and widely collected in practice. Growth curve modeling is a commonly used technique to analyze longitudinal data as it can directly investigate intraindividual changes over time and interindividual differences in intraindividual changes. An important line of my research is to develop methods to properly handle nonnormal longitudinal data with missing values. Bayesian methods have played a very important role here because they grant researchers a high degree of effectiveness in modeling messy data. They have

been shown to outperform traditional methods for small-sample problems. They are relatively less mathematically demanding for complex model estimations. In some cases, Bayesian methods are the only viable option for new types of models and analysis. I have proposed different robust latent growth curve modeling approaches where Bayesian methods were used with data augmentation and Markov Chain Monte Carlo algorithms for model estimation. For example, Tong and Zhang (2012) used Student's *t* distributions to model nonnormality and applied Bayesian methods for the model estimation. Tong and Zhang (2020) adopted a semiparametric Bayesian approach which is more flexible by treating the distributions of random effects and measurement errors as unknown random distributions using Dirichlet process mixtures. Tong et al. (under review) used a Bayesian selection model approach to model proportion data with non-ignorable missingness in cross-domain growth curve modeling. In sum, Bayesian growth curve modeling is very flexible and useful to interpret the longitudinal development of psychological and educational outcomes.

What are you currently working on?

I am currently leading a research team in carrying out a project on robust methods funded by the National Science Foundation (NSF). The project aims to develop a Bayesian quantile growth curve modeling strategy to address problems associated with longitudinal data including the handling of nonnormal and/or missing data, small sample sizes, large measurement errors, high-dimensional variable selection, and population heterogeneity. Instead of modeling the change of conditional means, the new approach will model the change of conditional quantiles, which avoids the distributional assumption of data in general. Currently, we have three papers published (e.g., Tong, Zhang, & Zhou, 2021), and several papers in revision or in preparation associated with this project. The utilization of quantiles also increases the interpretability of the model estimation results because it can investigate different levels of quantiles in a study cohort which may correspond to different subgroups of subjects. We have applied this method to an empirical study of certified B-corporation status and Google search interest. We found that although the number of certified B-corporations in the corresponding country did not influence the change of search interest of the company at the mean or median growth level, it significantly affected the search interest for companies at higher quantiles (e.g., companies whose search interests were at the 90th percentile). By imposing the idea of quantiles, the interindividual differences can be automatically studied.

In this project, we will also impose constraints through penalized functional principal component analysis to maintain the natural shape of the overall change trajectory. An extra benefit of the method is that the reproducibility problem in social and behavioral sciences may be reduced because the method is expected to work well for small-sized samples.

How can your research change the way studies are planned?

My career goal is to reveal the limitation of current models and methods in many disciplines, improve the understanding of scholars of how different data structures lead to different analytical models, broaden the knowledge of intrinsic relationships among meaningful constructs, and in general when studies are planned, I hope to raise awareness of the critical importance of appropriate data analyses in approaching data collected in social and behavioral sciences.

Specifically, I think each project is one step forward towards my long-term career goal. For example, in the study design phase, I have investigated whether adding supplemental samples is helpful to analyze longitudinal data with attritions (e.g., Taylor, Tong, & Maxwell, 2020). Researchers working with at-risk populations over time often experience attrition not expected in the initial study design. One common solution is to add supplemental samples to the original sample. But should the additional sample "refresh" the original sample through a random selection from the population, or should researchers attempt to "replace" participants lost through attrition? My studies advise adding refreshment samples in general to reduce bias of parameter estimates and increase statistical power. Replacement samples may lead to a larger bias and are thus not recommended. But we have also developed bias correction methods to help researchers who have already collected replacement samples make good use of their data (Mazen & Tong, 2020). My recent research on quantile growth curve modeling may resolve challenges in longitudinal research such as small sample sizes, large

measurement errors, and population heterogeneity, and thus reduce many concerns when planning the study.

What do you get out of LIFE?

I get way more out of LIFE than I expected. It is a shame that I have only attended the LIFE academies in Charlottesville because of travel conflicts and young kids, and then the pandemic. But only attending the events in Charlottesville, I already see LIFE as a treasure box. There were excellent talks and projects. I got chances to talk with our LIFE faculty and brilliant fellows, have fellows in my classes, and got involved in fellows' dissertation work. I definitely expect to go to other sites once the pandemic is over and develop new collaborations.

What is the added value of LIFE's internationality?

LIFE's internationality provides great opportunities to connect with LIFE faculty and fellows from different perspectives and views, learn from them, strengthen existing relationships, and generate new collaborations. Different from bigger international conferences, the twice-yearly LIFE academies can build a closer relationship among faculty and fellows. You can easily follow someone's research and collaborate with them. Of course the connections built by the LIFE program reach way beyond the academies. During the academy, you can broaden your thinking and knowledge by listening to new ideas and theories and recent trends related to the field. Understanding their culture illuminates your style of thinking in your research. The international connections can help you with your work to progress your research. After attending an academy, I always feel energized and rejuvenated returning to and continuing with my work.

How has the COVID pandemic changed the way you work?

The past 18 months were a great challenge for me. Virtual teaching and meetings may save the commute time for people, but for young faculty and researchers with kids, I would say the past year has been really hard to manage. With young kids staying home, I couldn't guarantee a sufficient amount of time to work each day. For a long period, I could only work 2–3 hours during the day. That included the time for teaching and meetings. To make up time, I stayed up late at night. To make sure I have enough sleep, I've meanwhile learned how to better manage time and work efficiently. I simply scheduled all my meetings back-to-back on one or two days each week and stayed away from my cell phone and all social media while I was working. I wrote down some small tasks each day (a task could be as small as writing just one paragraph for my paper) and put check marks on those tasks once they were done. It sounds simple but it's not that easy when first implementing it. However, after I got used to it, I am working much more efficiently and feel I have accomplished something every day. So I was not much less productive during the pandemic and I expect myself to be more productive once the life is back to normal.

References

Jacobucci, R., Grimm, K. J., & McArdle, J. J. (2016). Regularized structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal, 23*(4), 555–566. https://doi.org/10.1080/10705511.2016.1154793

Ke, Z., & Tong, X. (in press). Correcting for the multiplicative and additive effects of measurement unreliability in meta-analysis of correlation. *Psychological Methods*.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23–44. https://doi.org/10.1037/1082-989X.12.1.23

Mazen, J. A. M., & Tong, X. (2020). Bias correction for replacement samples in longitudinal research. multivariate behavioral research. Advance online publication. *Multivariate Behavioral Research*. https://doi.org/10.1080/00273171.2020.1794774

Taylor, L. K., Tong, X., & Maxwell, S. E. (2020). Evaluating supplemental samples in longitudinal research: Replacement and refreshment approaches. *Multivariate Behavioral Research, 55*(2), 277–299. https://doi.org/10.1080/00273171.2019.1628694

Tong, X., Kim, S., Bandyopadhyay, D., & Sun, S. (under review). *Longitudinal relation between body composition and body mass index: A Fels study with incomplete proportion data*.

Tong, X., & Zhang, Z. (2012). Diagnostics of robust growth curve modeling using Student's *t* distribution. *Multivariate Behavioral Research, 47*(4),

493–518. https://doi.org/10.1080/00273171.2012.692614

Tong, X., & Zhang, Z. (2020). Robust Bayesian approaches in growth curve modeling: Using Student's *t* distributions versus a semiparametric method. *Structural Equation Modeling: A Multidisciplinary Journal, 27*(4), 544–560. https://doi.org/10.1080/10705511.2019.1683014

Tong, X., Zhang, T., & Zhou, J. (2021). Robust Bayesian growth curve modelling using conditional medians. *British Journal of Mathematical and Statistical Psychology, 74*(2), 286–312. https://doi.org/10.1111/bmsp.12216

van der Ploeg, T., Austin, P. C. & Steyerberg, E. W. (2014). Modern modelling techniques are data hungry: A simulation study for predicting dichotomous endpoints. *BMC Medical Research Methodology, 14,* Article 137. https://doi.org/10.1186/1471-2288-14-137

Yuan, K.-H., & Liu, F. (2021). Which method is more reliable in performing model modification: Lasso regularization or Lagrange multiplier test? *Structural Equation Modeling: A Multidisciplinary Journal, 28*(1), 69–81. https://doi.org/10.1080/10705511.2020.1768858

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Thanks to LIFE Alumni Participating in Berlin Summer Seminar

We are very grateful to all LIFE alumni who found time to participate in this semester's Berlin LIFE seminar by chairing fellows' presentations of their research and discussing important issues with them and their co-fellows! Their commitment to LIFE is much appreciated!

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Janne Adolf, Yvonne Brehmer, Rasmus Bruckner, Aga Burzynska, Bill Chopik, Jaap Denissen, Johanna Drewelies, Charles Driver, Natalie Ebner, Yana Fandakova, Kristin Flegal, Robert Gaschler, Marie Hennecke, Oliver Huxhold, Benjamin Katz, Maike Kleemeyer, Lars Penke, Julia Rohrer, Stefan Schipolowski, Nicolas Schuck, Yee Lee Shing, Elisabeth Wenger, & Markus Werkle-Bergner

New LIFE Faculty in Zurich

Stephanie Wermelinger is a LIFE alumna and postdoctoral researcher at the chair of Developmental Psychology: Infancy and Childhood at UZH. She conducted her doctoral studies in developmental psychology at UZH. In 2018, she defended her PhD thesis, which investigated the interrelations of action perception and production across the lifespan. Using a variety of methods (i.e., behavioral studies, eye tracking, EEG), Stephanie Wermelinger seeks to explore how infants and toddlers come to understand others and develop into competent members of our society. Her research focuses on infants' and children's understanding of others' communication, comprising both their actions and language. Furthermore, she investigates how the context (e.g., learning to speak two languages at the same time) of children's upbringing influences th eir social abilities.

s.wermelinger@psychologie.uzh.ch

Key publications

Wermelinger, S., Gampe, A., Helbling, N., & Daum, M. M. (2020). Do you understand what I want to tell you? Early sensitivity in bilinguals' iconic gesture perception and production. *Developmental Science, 23*(5), Article e12943. https://doi.org/10.1111/desc.12943

Wermelinger, S., Gampe, A., & Daum, M. M. (2019). The dynamics of the interrelation of perception and action across the life span. *Psychological Research, 83,* 116–131. https://doi.org/10.1007/s00426-018-1058-8

Wermelinger, S., Gampe, A., & Daum, M. M. (2017). Bilingual toddlers have advanced abilities to repair communication failure. *Journal of Experimental Child Psychology, 155,* 84–94. https://doi.org/10.1016/j.jecp.2016.11.005

New LIFE Fellow in Zurich

Sabrina Beck. In 2015, I received my master's degree in Psychology at the University of Zurich and started training in Psychotherapy (CBT and Interpersonal Psychotherapy) at the Klaus-Grawe-Institute. For the next five years, I worked as a psychotherapist with children, adolescents, young adults and their families. During this time, I learned a lot about the impact of family cohesion, parental agreement and parenting practices on children's individual developmental trajectories. Driven by the motivation of using my clinical experience and knowledge for a better understanding of these interactions on a scientific level, I applied for a PhD program at the chair of Developmental Psychology: Infancy and Childhood as well as the Jacobs Center for Productive Youth Development at the University of Zurich, headed by Moritz Daum. In my dissertation project, I want to investigate the impact of parenting practices and parental agreement on children's socio-emotional development. For this purpose, I will use a smartphone-based application called the "kleineWeltentdecker-App". This ambulatory assessment tool allows parents of children from birth to 6 years to track the ongoing development of their children's skills in different domains by answering questions that are matched to the children's age, thereby covering the entire period in which changes of particular skills are expected to occur.

sabrina.beck@jacobscenter.uzh.ch

Website: www.kleineweltentdecker.ch

LIFE-Related Publications

Adolf, J. K., Loossens, T., Tuerlinckx, F., & Ceulemans, E. (2021). Optimal sampling rates for reliable continuous-time first-order autoregressive and vector autoregressive modeling. *Psychological Methods*. Advance online publication. https://doi.org/10.1037/met0000398

Anguera, J. A., Schachtner, J. N., Simon, A. J., Volponi, J., Javed, S., Gallen, C. L., & Gazzaley, A. (2021). Long-term maintenance of multitasking abilities following video game training in older adults. *Neurobiology of Aging, 103,* 22–30. https://doi.org/10.1016/j.neurobiolaging.2021.02.023

Arslan, R. C., **Reitz, A. K.**, Driebe, J. C., **Gerlach, T. M.**, & **Penke, L.** (2021). Routinely randomize potential sources of measurement reactivity to estimate and adjust for biases in subjective reports. *Psychological Methods, 26*(2), 175–185. https://doi.org/10.1037/met0000294

Bechtiger, L., Steinhoff, A., Buchmann, M., & **Shanahan, L.** (2021). Bidirectional associations between sympathy and self-disclosure in friendships from mid adolescence to early adulthood. *Journal of Research on Adolescence, 31*(2), 368–383. https://doi.org/10.1111/jora.12602

Bermudez, T., **Bierbauer, W.**, **Scholz, U.**, & Hermann, M. (2021). Depression and anxiety in cardiac rehabilitation: Differential associations with changes in exercise capacity and quality of life. *Anxiety, Stress, & Coping*. Advance online publication. https://doi.org/10.1080/10615806.2021.1952191

Chan, T., Reese, Z. A., & Ybarra, O. (2021). Better to brag: Underestimating the risks of avoiding positive self-disclosures in close relationships. *Journal of Personality*. Advance online publication. https://doi.org/10.1111/jopy.12635

Charles, S., **Röcke, C.**, Zadeh, R., **Martin, M.**, **Bokker, S.**, & **Scholz, U.** (2021). Leveraging daily social experiences to motivate healthy aging. *Journals of Gerontology: Series B.* Advance online publication. https://doi.org/10.1093/geronb/gbab028

Chin, K., Reese, Z. A., Sim, L., **Ascigil, E.**, & **Edelstein, R. S.** (2021). Closeness-inducing discussions with a romantic partner increase cortisol and testosterone. *Psychoneuroendocrinology, 132,* Article 105357. https://doi.org/10.1016/j.psyneuen.2021.105357

Choe, D. E. (2021). Curvilinear relations between preschool-aged children's effortful control and socioemotional problems: Racial-ethnic differences in functional form. *Child Psychiatry & Human Development, 52,* 693–708. https://doi.org/10.1007/s10578-020-01056-8

Depping, M. K., Best, R., & **Freund, A. M.** (2021). From gains to losses: Age-related differences in decisions under risk in a non-monetary gambling task. *British Journal of Developmental Psychology, 39,* 312–329. https://doi.org/10.1111/bjdp.12362

Depping, M. K., Uhlenbusch, N., Härter, M., Schramm, C., & Löwe, B. (2021). Efficacy of a brief, peer-delivered self-management intervention for patients with rare chronic diseases: A randomized clinical trial. *JAMA Psychiatry, 78*(6), 607–615. https://doi.org/10.1001/jamapsychiatry.2020.4783

Drewelies, J., Eibich, P., Düzel, S., **Kühn, S.**, Krekel, C., Goebel, J., Kolbe, J., Demuth, I., **Lindenberger, U.**, **Wagner, G. G.**, & **Gerstorf, D.** (2021). Location, location, location: The role of objective neighborhood characteristics for perceptions of control. *Gerontology*. Advance online publication. https://doi.org/10.1159/000515634

Garrett, D. D., **Skowron, A.**, Wiegert, S., **Adolf, J.**, Dahle, C. L., **Lindenberger, U.**, & **Raz, N.** (2021). Lost dynamics and the dynamics of loss: Longitudinal compression of brain signal variability is coupled with declines in functional integration and cognitive performance. *Cerebral Cortex*. Advance online publication. https://doi.org/10.1093/cercor/bhab154

Giangrande, E. J., & **Turkheimer, E.** (in press). Race, ethnicity, and the Scarr-Rowe hypothesis: A cautionary example of fringe science entering the mainstream. *Perspectives on Psychological Science*. Preprint: https://doi.org/10.31234/osf.io/md3qw

Gusakova, S., **Chin, K.**, **Ascigil, E.**, Conley, T. D., Chakravarty, D., Neilands, T. B., Hoff, C. C., & Darbes, L. A. (2021). Communication patterns among male couples with open and monogamous agreements. *Archives of Sexual Behavior, 50,* 1419–1431. https://doi.org/10.1007/s10508-020-01821-9

Hofer, M., & **Savell, S. M.** (2021). "There was no plan in place to get us help": Strategies for improv-

ing mental health service utilization among law enforcement. *Journal of Police and Criminal Psychology*. Advance online publication. https://doi.org/10.1007/s11896-021-09451-0

Horn, A. B., & **Röcke, C.** (2020). Aging dyads and health: New perspectives on interpersonal processes in aging [Editorial]. *GeroPsych, 33*(3), 117–123. https://doi.org/10.1024/1662-9647/a000242

Jager, J., & Keyes, K. M. (2021). Is substance use changing because of the COVID-19 pandemic? Conceptual and methodological considerations to delineating the impact of the COVID-19 pandemic on substance use and disorder. *Addiction, 116*(6), 1301–1303. https://doi.org/10.1111/add.15414

Joechner, A.-K., Wehmeier, S., & **Werkle-Bergner, M.** (2021). Electrophysiological indicators of sleep-associated memory consolidation in 5- to 6-year-old children. *Psychophysiology, 58*(8), Article e13829. https://doi.org/10.1111/psyp.13829

Jones, T. C., **Biele, G.**, Mühlemann, B., Veith, T., Schneider, J., Beheim-Schwarzbach, J., Bleicker, T., Tesch, J., Schmidt, M. L., Sander, L. E., Kurth, F., Menzel, P., Schwarzer, R., Zuchowski, M., Hofmann, J., Krumbholz, A., Stein, A., Edelmann, A., Corman, V. M., & Drosten, C. (2021). Estimating infectiousness throughout SARS-CoV-2 infection course. *Science, 373*(6551), Article eabi5273. https://doi.org/10.1126/science.abi5273

Karalija, N., **Papenberg, G.**, Wåhlin, A., Johansson, J., Andersson, M., Axelsson, J., Riklund, K., **Lindenberger, U.**, Nyberg, L., & Bäckman, L. (2021). Sex differences in dopamine integrity and brain structure among healthy older adults: Relationships to episodic memory. *Neurobiology of Aging, 105,* 272–279. https://doi.org/10.1016/j.neurobiolaging.2021.04.022

Knoll, N., Keller, J., Luszczynska, A., **Scholz, U.**, **Röcke, C.**, Schrader, M., & Heckhausen, J. (2020). Control strategies and daily affect: Couples adapt to new functional limitations. *GeroPsych, 33*(3), 155–169. https://doi.org/10.1024/1662-9647/a000229

Kobelt, M., **Sommer, V. R.**, Keresztes, A., **Werkle-Bergner, M.**, & **Sander, M. C.** (2021). Tracking age differences in neural distinctiveness across representational levels. *Journal of Neuroscience, 41*(15), 3499–3511. https://doi.org/10.1523/JNEUROSCI.2038-20.2021

Kühn, S., **Butler, O.**, Willmund, G., Wesemann, U., Zimmermann, P., & Gallinat, J. (2021). The brain at war: Effects of stress on brain structure in soldiers deployed to a war zone. *Translational Psychiatry, 11,* Article 247. https://doi.org/10.1038/s41398-021-01356-0

Kühn, S., Düzel, S., **Mascherek, A.**, Eibich, P., Krekel, C., Kolbe, J., Göbel, J., Gallinat, J., **Wagner, G. G.**, & **Lindenberger, U.** (2021). Urban green is more than the absence of city: Structural and functional neural basis of urbanicity and green space in the neighbourhood of older adults. *Landscape and Urban Planning, 214,* Article 104196. https://doi.org/10.1016/j.landurbplan.2021.104196

Kühn, S., **Mascherek, A.**, Filevich, E., **Lisofsky, N.**, Becker, M., **Butler, O.**, Lochstet, M., Mårtensson, J., **Wenger, E.**, **Lindenberger, U.**, & Gallinat, J. (2021). Spend time outdoors for your brain: An in-depth longitudinal MRI study. *World Journal of Biological Psychiatry*. Advance online publication. https://doi.org/10.1080/15622975.2021.1938670

Kurthen, I., Galbier, J., **Jagoda, L.**, Neuschwander, P., **Giroud, N.**, & **Meyer, M.** (2021). Selective attention modulates neural envelope tracking of informationally masked speech in healthy older adults. *Human Brain Mapping, 42*(10), 3042–3057. https://doi.org/10.1002/hbm.25415

Leos-Toro, C., Ribeaud, D., **Bechtiger, L.**, Steinhoff, A., Nivette, A., Murray, A., Hepp, U., Quednow, B. B., Eisner, M., & **Shanahan, L.** (2021). Attitudes toward COVID-19 vaccination among young adults in urban Switzerland, September 2020. *International Journal of Public Health, 66,* Article 643486. https://doi.org/10.3389/ijph.2021.643486

Lin, Z., Werner, A., **Lindenberger, U.**, Brandmaier, A. M., & **Wenger, E.** (2021). Assessing music expertise: The Berlin Gehoerbildung Scale. *Music Perception, 38*(4), 406–421. https://doi.org/10.1525/mp.2021.38.4.406

Mayer, Z., & **Freund, A. M.** (2021). Self-control from a multiple goal perspective of mixed reward options. *Behavioral and Brain Sciences, 44,* Article E48. https://doi.org/10.1017/S0140525X20000916

Nolden, S., **Brod, G.**, Meyer, A.-K., **Fandakova, Y.**, & **Shing, Y. L.** (2021). Neural correlates of successful memory encoding in kindergarten and early elementary school children: Longitudinal trends and effects of schooling. *Cerebral Cortex, 31,* 3764–3779. https://doi.org/10.1093/cercor/bhab046

Palmer, G. J., **Cole-Lewis, Y. C.**, **Goodwill, J. R.**, & Mattis, J. S. (2021). No crystal stair: Predictors

of pessimism among Black American men. *Journal of Men's Studies, 29*(2), 235–254. https://doi.org/10.1177/1060826520947479

Palumbo, F., Crivello, A., Furfari, F., Girolami, M., Mastropietro, A., Manferdelli, G., **Röcke, C.**, **Guye, S.**, Salvá Casanovas, A., Caon, M., Carrino, F., Abou Khaled, O., Mugellini, E., Denna, E., Mauri, M., Ward, D., Subías-Beltrán, P., Orte, S., Candea, C., Candea, G., & Rizzo, G. (2020). "Hi this is NESTORE, your personal assistant": Design of an integrated IoT system for a personalized coach for healthy aging. *Frontiers in Digital Health, 2,* Article 545949. https://doi.org/10.3389/fdgth.2020.545949

Potter, S., **Gerstorf, D.**, **Schmiedek, F.**, **Drewelies, J.**, Wolff, J., & **Brose, A.** (2021). Health sensitivity in the daily lives of younger and older adults: Correlates and longer-term change in health. *Aging & Mental Health*. Advance online publication. https://doi.org/10.1080/13607863.2021.1913475

Reback, C. J., **Rünger, D.**, & Fletcher, J. B. (2021). Drug use is associated with delayed advancement along the HIV care continuum among transgender women of color. *AIDS and Behavior, 25,* 107–115. https://doi.org/10.1007/s10461-019-02555-z

Roberts, S. O., & Rizzo, M. T. (2020). The psychology of American racism. *American Psychologist, 76*(3), 475-487. https://doi.org/10.1037/amp0000642

Rohrer, J. M., & Arslan, R. C. (2021). Precise answers to vague questions: Issues with interactions. *Advances in Methods and Practices in Psychological Science, 4*(2). https://doi.org/10.1177/25152459211007368

Shanahan, L., Hill, S., **Bechtiger, L.**, Steinhoff, A., Godwin, J., Gaydosh, L. M., Harris, K. M., Dodge, K. A., & Copeland, W. E. (2021). Prevalence and childhood precursors of young adult opioid use. *JAMA Pediatrics, 175*(3), 276–285. https://doi.org/10.1001/jamapediatrics.2020.5205

Stallasch, S. E., Lüdtke, O., Artelt, C., & **Brunner, M.** (2021). Multilevel design parameters to plan cluster-randomized intervention studies on student achievement in elementary and secondary school. *Journal of Research on Educational Effectiveness, 14*(1), 172–206. https://doi.org/10.1080/19345747.2020.1823539

Steinman, S. A., Namaky, N., Thomas, S. L., Meissel, E., St. John, A. T., Pham, N.-H., **Werntz, A.**, Saunders, T., Gorlin, E. I., Arbus, S., Beltzer, M. L., Soroka, A., & **Teachman, B. A.** (2021). Which variations of cognitive bias modification for interpretations lead to the strongest effects? *Cognitive Therapy and Research, 45,* 367–382. https://doi.org/10.1007/s10608-020-10168-3

Wenger, E., **Papadaki, E.**, Werner, A., **Kühn, S.**, & **Lindenberger, U.** (2021). Observing plasticity of the auditory system: Volumetric decreases along with increased functional connectivity in aspiring professional musicians. *Cerebral Cortex Communications, 2*(2), Article tgab008. https://doi.org/10.1093/texcom/tgab008

Womack, S. R., Clifford, S., **Wilson, M. N.**, Shaw, D. S., & Lemery-Chalfant, K. (2021). Genetic moderation of the association between early family instability and trajectories of aggressive behaviors from middle childhood to adolescence. *Behavior Genetics*. Advance online publication. https://doi.org/10.1007/s10519-021-10069-5

Zocher, S., Overall, R. W., Lesche, M., Dahl, A., & **Kempermann, G.** (2021). Environmental enrichment preserves a young DNA methylation landscape in the aged mouse hippocampus. *Nature Communications, 12,* Article 3892. https://doi.org/10.1038/s41467-021-23993-1

Photo: Matthias Oberholzer on Unsplash

LIFE News

- The *Spring Academy 2021* took place online in Ann Arbor (see pp. 16 ff. for fellows' abstracts).
- The *Fall Academy 2021* will be held in a hybrid format at UZH from October 11 to 13, 2021. The Berlin fellows and some of the faculty will travel to Zurich to attend it in person while the UM and UVA fellows and faculty will take part online.

Exchanges

- UM fellow *Colleen Frank* is working on a collaborative project with alumnus and faculty *Thorsten Pachur* and is spending 6 weeks at the Center for Adaptive Rationality (ARC), MPIB in July/August.

LIFE Berlin

- MPIB alumna and faculty *Annette Brose* has taken up a new research scientist position at FU, working with Christina Knaevelsrud in the Division of Clinical Psychological Intervention.
- MPIB alumnus *Martin Dahl* (now working as a postdoc with his affiliation shared between the Center for Lifespan Psychology, MPIB, and Mara Mather's lab at University of Southern California) has been awarded the Max Planck Society's Otto Hahn Medal 2021 for his doctoral thesis entitled "Neuromodulation and Rhythmic Neural Activity Shape Cognition Across the Adult Lifespan."
- MPIB fellow *Angela Jones* successfully defended her dissertation entitled "Active Learning Strategies in Child- and Adulthood: An Interdisciplinary Perspective" at the Technical University of Munich in June.
- MPIB alumna *Maike Kleemeyer* has been appointed as the MPIB's first Research Data Management Coordinator and is now affiliated with the Library. Together with the Research Data Management Group, she organized a (virtual) Git-Workshop with Antonio Amaddio. The fellows found this very helpful.
- MPIB alumna *Poldi Kuhl* has been appointed Professor for Educational Psychology at Leuphana University Lüneburg, Germany.
- FU alumna *Judith Mangelsdorf* has become the first Professor of Positive Psychology in German-speaking countries at the Deutsche Hochschule für Gesundheit und Sport (DHGS) in Berlin.
- MPIB fellow *Claire Pauley* was awarded a poster prize for her poster on age differences in neural differentiation at the annual conference "Psychology and the Brain (PuG)" of the Division of Biological Psychology and Neuropsychology of the German Psychological Society (DGPs) and the German Society for Psychophysiology and its Application (DGPA). The conference was held online due to COVID-19.
- Fellow *Karola Schlegelmilch* has successfully defended her dissertation entitled "Grass or Gravel? Influences on the Visual Categorization of Naturalistic Structures in Infancy and Early Childhood" at Universität Potsdam.
- DIW alumna *Mila Staneva* has taken up a new position as a policy analyst at the Organisation for Economic Co-operation and Development (OECD) in Paris. She is working at the Directorate for Education and Skills in a project which explores the impact of Artificial Intelligence on the development of skills.
- Faculty *Timo von Oertzen* has launched a new journal striving to foster the development of methods in psychology and related fields: *Journal for Quantitative and Computational Methods in Behavioral Sciences (QCMB)*. To achieve this aim, QCMB publishes scientific articles that are suited to extend the understanding of foundational mathematics used in psychological methods, development of new methods and software or hardware for those, comparison of existing or new methods, and dissemination of this knowledge to a broader audience of scientists in psychology or related fields. QCMB is dedicated to Open Science. Several LIFE colleagues are involved: UVA alumnus *Tim Brick* and HU faculty *Manuel Völkle* are members of the Editorial Board among others, *Steve Boker*, *Ulman Lindenberger*, and UVA alumnus *Jeff Spies* are among the members of the Editorial Advisory Board, and UVA faculty *Hudson Golino* and *Cynthia Tong*

are the Associate Editors. See https://qcmb.psychopen.eu for more information.

- The Berlin fellows very much appreciated the recent Summer Seminar with invited alumni who provided very useful feedback on the fellows' projects (for a list of the alumni who participated, see p. 32).

LIFE Michigan

- *Kristi Chin* has taken over from *Poortata (Pia) Lalwani* as the UM Fellow Speaker. Many thanks to Pia for her work!
- Fellow *Esra Ascigli* received the ISR-Rackham Summer Training Award.
- Faculty *Toni Antonucci* has received the APA Division 20 Baltes Distinguished Research Achievement Award, which was established to honor researchers with distinguished careers that have featured exceptional theoretical and empirical contributions to the psychological science of aging.
- Faculty *Adriene Beltz* has received the UM's Wilbert McKeachie Award for Excellence in Lecture-Based Teaching. She has also won the APA Division 5's Anne Anastasi Distinguished Early Career Contributions Award.
- Fellow *Colleen Frank* has successfully defended her dissertation entitled "Predicting Our Future Feelings: The Role of Working Memory for Emotion." She received the Federation of Associations in Behavioral and Brain Science (FABBS) Doctoral Dissertation Research Excellence Award for this work. This fall, she will become a postdoctoral research associate at the Center for Vital Longevity at University of Texas–Dallas. She will be working with Kendra Seaman to examine the cognitive and affective mechanisms of risky decision making in older adults.
- UM alumna *Ziyong Lin* has moved on from her postdoc position at MPIB to work with Amazon in Berlin as a Senior Behavioral Scientist.
- Together with other UM colleagues, faculty *Priti Shah* and fellow *Pia Lalwan*i are winners of the 2021 John A. Swets Memorial Award for Excellence in Collaborative Research in Psychological Science for their project "Dysfunctions in Cognition due to COVID-19" which will collect and analyze data on this issue.
- Faculty *Thad Polk* has received the 2021 Graduate Mentoring Award. This award honors a Psychology faculty member who goes "above and beyond as a supportive mentor and role model in graduate students' educational and career development."
- Faculty *Laura Zahodne* has received the Margret M. and Paul B. Baltes Award of the Gerontological Society of America (GSA), which "acknowledges outstanding early career contributions in behavioral and social gerontology."

LIFE Virginia

- Fellow *Evan Giangrande* was awarded the Dean's Dissertation Completion Fellowship from the UVA Graduate School of Arts and Sciences
- Fellow *Meltem Yucel* has successfully defended her dissertation entitled "'No Fair!': An Investigation of Children's Development of Fairness." She is currently a Student Affiliate at the Center for the Science of Moral Understanding and Research Affiliate at Cornell University's Early Childhood Cognition Lab. In Fall 2021, she will become a Postdoctoral Associate at Duke University's Department of Psychology and Neuroscience.

LIFE Zurich

- *Sabrina Beck* has joined LIFE Zurich as a new fellow. Welcome!
- Alumna *Stefanie Wermelinger* has rejoined LIFE Zurich as a faculty member (see p. 33 for further information on both new LIFE members).
- Fellow *Tania Bermudez* successfully defended her dissertation entitled "The Relevance of Affective, Stress Response, Socio-Cognitive, and Implicit Factors for the Physical Activity of Cardiac Disease Patients" in April. In August, she will start working with Claudio Nigg as a postdoctoral researcher at Universität Bern in Switzerland on an intervention to increase the physical activity of cardiac patients.
- Due to the COVID-19 pandemic, *Tania Bermudez* had to return early from her research stay with Niall Bolger at New York University but has continued their research collaboration remotely.

- Fellow *Julia Brehm* successfully defended her dissertation entitled "Processes Underlying Social Learning: The Influence of Informant Characteristics on Children's Attention and Memory Processes in Action and Word Learning" in June. She is continuing her work on cognitive processes underlying children's social learning with Moritz Daum in addition to teaching at the UZH.
- Fellow *Ebru Ger* successfully defended her dissertation entitled "The Influence of Language on Children's Causal Event Representation: A Crosslinguistic Approach" in May and has started a postdoc in Developmental Psychology at Universität Bern in Switzerland. She is working on improving kindergarten children's error monitoring skills with Claudia Roebers.
- HU alumna and UZH faculty *Gizem Hülür* is returning to Europe as a W2 Professor of Developmental and Educational Psychology at the University of Bonn in Germany.
- UZH alumna *Dalit Jäckel* has taken up a new position as co-head of the Prevention area at the Pro Menta Sana Foundation in Zurich. Pro Mente Sana supports people with mental health problems and their families. She will mainly be responsible for the "ensa" project, the Swiss Mental Health First Aid program: https://ensa.swiss/en/.
- Fellow *Zita Mayer* will visit Ulrich Mayr at the University of Oregon in autumn. Her research stay was originally planned in 2020 but was postponed due to the COVID-19 pandemic.
- UVA alumnus *Robert Moulder* is on a 6-month research visit to work with faculty (and MPIB alumna) *Christina Röcke* and *Mike Martin*. They are working on the intensive longitudinal everyday activity data from their "Mobility, Activity, and Social Interactions Study (MOASIS)" to examine complexity and develop new methodological strategies.

LIFE on Twitter!

See https://twitter.com/IMPRS_LIFE and/or tweet to @imprs-life

Frequently used acronyms in LIFE

CRTD: Center for Regenerative Therapies Dresden

DIW: Deutsches Institut für Wirtschaftsforschung [German Institute for Economic Research]

DZA: Deutsches Zentrum für Altersfragen [German Centre of Gerontology]

FU: Freie Universität Berlin

HU: Humboldt-Universität zu Berlin

LIFE: International Max Planck Research School on the Life Course

UM: University of Michigan

UVA: University of Virginia

UZH: University of Zurich

MPIB: Max-Planck-Institut für Bildungsforschung [Max Planck Institute for Human Development]

Photo: Haley Owens on Unsplash

LIFE Newsletter

Editor
Julia Delius, Max Planck Institute for Human Development | delius@mpib-berlin.mpg.de

Aim of the newsletter
The LIFE newsletter encourages collaboration and interaction among people within the LIFE program. It provides an information platform where fellows, alumni, and faculty members can learn more about each other's research, and identify colleagues with similar interests and possible projects for collaboration.

Contributions
Please send contributions, suggestions, and input to the editor.

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Editorial office
Max Planck Institute for Human Development | Lentzeallee 94 | 14195 Berlin | Germany