

## TRENDS IN COGNITION PSMT61

### *Course Description*

This is a master and postgraduate course on cognitive functions. The aim of the course is to present current trends and topics in cognitive psychology with the primary focus on human memory functions, thinking, decision making and related cognitive functions. The course will primarily cover emerging topics that are not always covered in introductory courses, but that have become important themes in cognitive psychology. The course will include reproducibility, music, navigation, cognition in non-human animals, decision-making, and cognitive effects of testing and training.

The course will be based on a series of seminars during which students read and discuss empirical and theoretical articles germane to understanding of the emerging and central issues in cognitive psychology. Activities related to the seminars are mandatory. A lecture will introduce each topic and provide a historical and theoretical background before the seminar. The lecture is accompanied by supplementary readings. The lectures and the supplementary readings provide an additional resource but are not required.

### *Course Objectives*

After completing the course:

- Students should have increased understanding of outstanding topics of cognition and their methodological challenges.
- Students should be able to analyze and critically reflect on central trends of cognitive psychology.
- Students should acquire a deepened understanding of basic issues of cognitive psychology and their relation to multiple perspectives of cognitive sciences and complementary levels of explanation

### *Course Requirements*

The course consists of lectures, seminars and exercises. To reach the course objectives, students need to attend and participate in all seminars as follows:

- (a) *Contribution to seminars.* In addition to active participation, students are expected to generate outstanding question(s) prior to each seminar. The purpose of these questions and is to ensure that you have read the papers that have been assigned, and to help raise central issues for the discussion. You should submit (upload) you question(s) to the course web by noon the day before the seminar. You should also submit a separate PM in which you analyse and discuss your proposed question. Your proposal should reflect the general theme of each seminar, but you may also consider theoretical perspectives and empirical findings, which are not necessarily covered by the target articles. The document should be around 300-500 words and uploaded to the course web before each seminar.
- (b) *Leading the discussion.* At each seminar, 1-2 students have the role of Discussants by organizing and leading the group discussion. Discussants will primarily summarize the key points to be extracted from the seminar topic and chair the session by presenting central issues raised the members of the group. Note that Discussants will lead the seminar, but everyone in the group is responsible for contributing to the seminar. Discussants do not

need to submit questions for their seminars.

### *Examination*

The examination is based on each student's contribution during the seminar, including the written PM, with max 2 points/seminar (2 = good, 1 = pass, and 0 = fail/missed seminar). The max score for the whole course is 14 p as summarized below:

Seminars	7 x	2p (=max)	14
Final grade	A	≥13	
	B	≥11	
	C	≥9	
	D	≥8	
	E	≥7	
	F	<7	

### *Readings*

Readings and other course materials are based on empirical research articles and overviews, available at [the course website](#).

### ***T1: Cognitive Metascience***

#### *Target articles for seminar*

Nosek, B. A., Ebersole, C. R., DeHaven, A. C., & Mellor, D. T. (2018). The preregistration revolution. *Proceedings of the National Academy of Sciences*, 201708274.

Hoogeveen, S., Sarafoglou, A., & Wagenmakers, E.-J. (2020). Laypeople Can Predict Which Social-Science Studies Will Be Replicated Successfully. *Advances in Methods and Practices in Psychological Science*, 267–285. <https://doi.org/10.1177/2515245920919667>

Ebersole, C. R., Axt, J. R., & Nosek, B. A. (2016). Scientists' Reputations Are Based on Getting It Right, Not Being Right. *PLoS biology*, 14(5), e1002460. <https://doi.org/10.1371/journal.pbio.1002460>

#### *Supplementary reading (not mandatory)*

Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science (New York, N.Y.)*, 349(6251), aac4716. <https://doi.org/10.1126/science.aac4716>

Wagenmakers, E. J., Dutilh, G., & Sarafoglou, A. (2018). The Creativity-Verification Cycle in Psychological Science: New Methods to Combat Old Idols. *Perspectives on psychological science : a journal of the Association for Psychological Science*, 13(4), 418–427. <https://doi.org/10.1177/1745691618771357>

## **T2: Cognitive Training**

### *Target articles for seminar*

Sala, G., & Gobet, F. (2019). Cognitive Training Does Not Enhance General Cognition. *Trends in cognitive sciences*, 23(1), 9–20. <https://doi.org/10.1016/j.tics.2018.10.004>

Olofsson, J. K., Ekström, I., Lindström, J., Syrjänen, E., Stigsdotter-Neely, A., Nyberg, L., Jonsson, S., & Larsson, M. (2020). Smell-Based Memory Training: Evidence of Olfactory Learning and Transfer to the Visual Domain. *Chemical senses*, 45(7), 593–600. <https://doi.org/10.1093/chemse/bjaa049>

Nilsson, J., Lebedev, A. V., Rydström, A., & Lövdén, M. (2017). Direct-Current Stimulation Does Little to Improve the Outcome of Working Memory Training in Older Adults. *Psychological science*, 28(7), 907–920. <https://doi.org/10.1177/0956797617698139>

### *Supplementary reading (not mandatory)*

Hertzog, C., Kramer, A. F., Wilson, R. S., & Lindenberger, U. (2008). Enrichment Effects on Adult Cognitive Development: Can the Functional Capacity of Older Adults Be Preserved and Enhanced?. *Psychological science in the public interest : a journal of the American Psychological Society*, 9(1), 1–65. <https://doi.org/10.1111/j.1539-6053.2009.01034.x>

Simons, D. J., Boot, W. R., Charness, N., Gathercole, S. E., Chabris, C. F., Hambrick, D. Z., & Stine-Morrow, E. A. (2016). Do "Brain-Training" Programs Work?. *Psychological science in the public interest : a journal of the American Psychological Society*, 17(3), 103–186. <https://doi.org/10.1177/1529100616661983>

## **T3: Spatial Cognition and Navigation**

### *Target articles for seminar*

Bierbrauer, A., Kunz, L., Gomes, C. A., Luhmann, M., Deuker, L., Getzmann, S., Wascher, E., Gajewski, P. D., Hengstler, J. G., Fernandez-Alvarez, M., Atienza, M., Cammisuli, D. M., Bonatti, F., Pruneti, C., Percesepe, A., Bellaali, Y., Hanseeuw, B., Strange, B. A., Cantero, J. L., & Axmacher, N. (2020). Unmasking selective path integration deficits in Alzheimer's disease risk carriers. *Science advances*, 6(35), eaba1394. <https://doi.org/10.1126/sciadv.aba1394>

Graves, K. N., Antony, J. W., & Turk-Browne, N. B. (2020). Finding the Pattern: On-Line Extraction of Spatial Structure During Virtual Navigation. *Psychological science*, 31(9), 1183–1190. <https://doi.org/10.1177/0956797620948828>

Buzsáki, G., & Tingley, D. (2018). Space and Time: The Hippocampus as a Sequence Generator. *Trends in cognitive sciences*, 22(10), 853–869. <https://doi.org/10.1016/j.tics.2018.07.006>

### *Supplementary reading (not mandatory)*

Moser, E. I., Kropff, E., & Moser, M. B. (2008). Place cells, grid cells, and the brain's spatial representation system. *Annual review of neuroscience*, *31*, 69–89. <https://doi.org/10.1146/annurev.neuro.31.061307.090723>

Epstein, R. A., Patai, E. Z., Julian, J. B., & Spiers, H. J. (2017). The cognitive map in humans: spatial navigation and beyond. *Nature neuroscience*, *20*(11), 1504–1513. <https://doi.org/10.1038/nn.4656>

#### ***T4: Music and cognition***

##### *Target articles for seminar*

Jakubowski, K., Finkel, S., Stewart, L., & Müllensiefen, D. (2017). Dissecting an earworm: Melodic features and song popularity predict involuntary musical imagery. *Psychology of Aesthetics, Creativity, and the Arts*, *11*(2), 122–135. <https://doi.org/10.1037/aca0000090>

Martínez-Molina, N., Mas-Herrero, E., Rodríguez-Fornells, A., Zatorre, R.J., Marco-Pallarés, J. (2016). Neural correlates of specific musical anhedonia. *Proceedings of the National Academy of Sciences*, *113*(46), E7337-E7345; DOI: 10.1073/pnas.1611211113

Bainbridge CM, Bertolo M, Youngers J, Atwood S, Yurdum L, Simson J, Lopez K, Xing F, Martin A, Mehr SA. Infants relax in response to unfamiliar foreign lullabies. *Nat Hum Behav*. 2020 Oct 19. doi: 10.1038/s41562-020-00963-z. Epub ahead of print.

##### *Supplementary reading (not mandatory)*

Savage PE, Loui P, Tarr B, Schachner A, Glowacki L, Mithen S, Fitch WT. Music as a coevolved system for social bonding. *Behav Brain Sci*. 2020 Aug 20:1-42. doi: 10.1017/S0140525X20000333. Epub ahead of print.

Thompson WF, Marin MM, Stewart L. Reduced sensitivity to emotional prosody in congenital amusia rekindles the musical protolanguage hypothesis. *Proc Natl Acad Sci U S A*. 2012 Nov 13;109(46):19027-32. doi: 10.1073/pnas.1210344109.

#### ***T5: Cognition in Non-Human Animals***

##### *Target articles for seminar*

Kabadayi, C., & Osvath, M. (2017). Ravens parallel great apes in flexible planning for tool-use and bartering. *Science (New York, N.Y.)*, *357*(6347), 202–204. <https://doi.org/10.1126/science.aam8138>

Krupenye, C., Kano, F., Hirata, S., Call, J., & Tomasello, M. (2016). Great apes anticipate that other individuals will act according to false beliefs. *Science (New York, N.Y.)*, *354*(6308), 110–114. <https://doi.org/10.1126/science.aaf8110>

Alem, S., Perry, C. J., Zhu, X., Loukola, O. J., Ingraham, T., Søvik, E., & Chittka, L. (2016). Associative Mechanisms Allow for Social Learning and Cultural Transmission of String Pulling in an Insect. *PLoS biology*, *14*(10), e1002564. <https://doi.org/10.1371/journal.pbio.1002564>

*Supplementary reading (not mandatory)*

Andrews, Kristin, "Animal Cognition", *The Stanford Encyclopedia of Philosophy* (Summer 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2016/entries/cognition-animal/>.

**T6: Testing effects in memory**

*Target articles for seminar*

Putnam, A. L., Nestojko, J. F., & Roediger, H. L. (2016). Improving student learning: Two strategies to make it stick. In J. C. Horvath, J. Lodge, & J. A. C. Hattie (Eds.), *From the laboratory to the classroom: Translating the science of learning for teachers*. (pp. 94-121). Oxford, U.K.: Routledge

Rowland C. A. (2014). The effect of testing versus restudy on retention: a meta-analytic review of the testing effect. *Psychological bulletin*, *140*(6), 1432–1463. <https://doi.org/10.1037/a0037559>

Karlsson Wirebring, L., Wiklund-Hörnqvist, C., Eriksson, J., Andersson, M., Jonsson, B., & Nyberg, L. (2015). Lesser Neural Pattern Similarity across Repeated Tests Is Associated with Better Long-Term Memory Retention. *The Journal of neuroscience : the official journal of the Society for Neuroscience*, *35*(26), 9595–9602. <https://doi.org/10.1523/JNEUROSCI.3550-14.2015>

*Supplementary reading (not mandatory)*

Roediger, H. L., 3rd, & Karpicke, J. D. (2006). The Power of Testing Memory: Basic Research and Implications for Educational Practice. *Perspectives on psychological science : a journal of the Association for Psychological Science*, *1*(3), 181–210. <https://doi.org/10.1111/j.1745-6916.2006.00012.x>

Roediger, H. L., 3rd, & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in cognitive sciences*, *15*(1), 20–27. <https://doi.org/10.1016/j.tics.2010.09.003>

**T7: Decision-Making and Behavioral Economics**

*Target articles for seminar*

Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss J Economics Statistics* **155**, 1. <https://doi.org/10.1186/s41937-019-0027-5>

Fernandes, D., Lynch, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, *60*(8), 1861-1883. Retrieved from <https://search-proquest-com.ezp.sub.su.se/scholarly-journals/financial-literacy-education-downstream-behaviors/docview/1560812297/se-2?accountid=38978>

Artinger, F.M., Artinger, S. & Gigerenzer, G. (2019). C. Y. A.: frequency and causes of defensive decisions in public administration. *Bus Res* **12**, 9–25. <https://doi.org/10.1007/s40685-018-0074-2>

*Supplementary reading (not mandatory)*

Fischhoff, B., & Broomell, S. B. (2020). Judgment and Decision Making. *Annual review of psychology*, *71*, 331–355. <https://doi.org/10.1146/annurev-psych-010419-050747>

Simon H. A. (1956). Rational choice and the structure of the environment. *Psychological review*, *63*(2), 129–138. <https://doi.org/10.1037/h0042769>