Yixuan Ku

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Education:

2004/9-2010/6	Ph.D.	Biomedical Engineering, *Tsinghua University*, Beijing, China
2000/9-2004/7	B.S.	Biomedical Engineering, *Tsinghua University*, Beijing, China

Academic Appointments:

2020/1-Present	Professor	Department of Psycholog, *Sun Yat-sen University*, Guangzhou, China
2017/12-2019/12	Professor	School of Psychology and Cognitive Science, *East China Normal University*, Shanghai, China
2015/9-2017/12	Associate Professor	School of Psychology and Cognitive Science, *East China Normal University*, Shanghai, China
2013/9-2015/8	Visiting Scholar, Postdoctoral Fellow	Dept. of Neurology & Physiology, *University of California, San Francisco* (Prof. Adam Gazzaley & Ted Zanto)
2012/7-2013/8	Associate Professor	School of Psychology and Cognitive Science, *East China Normal University*, Shanghai, China
2010/7-2012/6	Postdoctoral Fellow	School of Psychology and Cognitive Science, *East China Normal University*, Shanghai, China (Prof. Yong-Di Zhou)
2008/12-2010/6	Research Associate	Dept. of Biomedical Engineering, *Tsinghua University*, Beijing, China (Prof. Shangkai Gao & Bo Hong)

Research Interests:

- Neural mechanisms underlying working memory
- Cognitive and neural modulations of working memory
- Working memory deficits in patients (mild cognitive impairment and schizophrenia)

Honors & Awards

2020	Hundred Top Talents Program from Sun Yat-sen University
2018	Excellent achievement award of Philosophy and Social Sciences in Shanghai, Second Class
2017	Challenge Cup National extracurricular academic scientific and technological works competition Second Class (Mentor)
2017	Challenge Cup Shanghai extracurricular academic scientific and technological works competition First Class (Mentor)
2016	Shanghai Pujiang Talent Award
2015	Scholarship of Summer Institute in Cognitive Neuroscience

2014	Teaching achievement award Second Class (State) (Joint contributor 8)
2013	Teaching achievement award First Class (Shanghai) (Joint contributor 7)
2013	China Scholarship Council (Excellent Young Faculty Awards Program)
2009	“Friends of Tsinghua” Scholarship (Second Class)
2007	“Friends of Tsinghua” Scholarship (Second Class)
2005	Winner of Graduate Mathematic Modeling Competition China (Second Class)
2005	“Schneider Electric” Scholarship (First Class)
2003	“Friends of Tsinghua” Scholarship (First Class)
2001	“Friends of Tsinghua” Scholarship (Second Class)

Grant Support:

(As PI)

2022.1-2025.12	National Natural Science Foundation of China (32171082)	Addiction-related cues influence working memory: cognitive neural mechanisms and interventions
2020.01-2021.12	Sun Yat-sen University	One Hundred Top Talents Program
2019.7-2021.6	Science and Technology Commission Shanghai Municipal (19ZR1416700)	Affective influence of working memory processes: cognitive and neural mechanisms
2017.12-2020.12	National Social Science Foundation (17ZDA323)	Promoting quality of basic education: methods and mechanisms
2017.9-2019.8	Major Program of Science and Technology Commission Shanghai Municipal (17JC1404105)	Integration between Processing of Language in Human Brain and Computing Models of Artificial Intelligence
2017.10-2018.10	Huawei Innovation Research Program	Development of Brain-like Artificial Intelligence System
2017.7-2020.12	Fundamental Research Funds for the Central Universities (2017ECNU-YYJ050)	Neural processes underlying the top-down vs. bottom-up processes during working memory
2017.5-2018.12	NYU-Shanghai ECNU Joint Research Funding (10407_20170317)	Neural processes underlying the interplay between affective information and working memory
2016.9-2018.8	Shanghai Pujiang Talent Award (16PJC022)	Ageing influence of distractor inhibition during working memory
2015.1-2017.12	Shanghai Committee of Science and Technology (15ZR1410600)	Neural mechanisms underlying capacity and precision of working memory
2013.1-2014.12	Innovation Fund of East China Normal University	Top-down attention control in the processes of working memory
2012.1-2012.12	National Natural Science Foundation of China (31100742)	The interplay of primary somatosensory cortex and prefrontal cortex in cross-modal perception and memory
2010.7-2012.6	China Postdoctoral Science Foundation (20100480615)	The role of primary somatosensory cortex in cross-modal perception and memory

(As Co-PI)

2018.1-2021.12	National Natural Science Foundation of China (C090302)	The Role and Mechanism of Nonverbal Hemisphere in Linguistic System (PI: Qing Cai)
2013.1-2017.8	National Key Fundamental Research (973) Program (2013CB329501)	Neural mechanisms of multisensory and sensory-motor integration (PI: Yong-Di Zhou)
2013.1-2015.12	National Natural Science Foundation of China (31200834)	Primary sensory cortices in high cognitive functions (PI: Liping Wang)
2012.1-2014.12	National Natural Science Foundation of China (31100741)	Neural mechanisms of incubation effects on divergent creative thinking (PI: Ning Hao)

Peer-reviewed Publications (SCI/SSCI indexed)

(* corresponding author, # co-first author)

- Zhao, Y-J, Kay, K.N., Tian, Y, & **Ku, Y*** (2021). Sensory Recruitment Revisited: Ipsilateral V1 Involved in Visual Working Memory. ***Cerebral Cortex***, bhab300. https://doi.org/10.1093/cercor/bhab300
- Zhao, Y.-J. #, Ma, T. #, Zhang, L., Ran, X., Zhang, R.-Y. *, & **Ku, Y.** * (2021). Atypically larger variability of resource allocation accounts for visual working memory deficits in schizophrenia. ***PLoS Computational Biology***, 17(11), e1009544. http://doi.org/10.1371/journal.pcbi.1009544
- Han, S#, Zhu, R#, & **Ku, Y*** (2021). Background white noise and speech facilitate visual working memory. ***European Journal of Neuroscience***, 54(7), 6487–6496. http://doi.org/10.1111/ejn.15455
- Xie, Y, Li, Y*, Nie, L, Zhang, W, Ke, Z, & **Ku, Y*** (2021). Cognitive enhancement of repetitive transcranial magnetic stimulation in patients with mild cognitive impairment and early Alzheimer's Disease: a systematic review and meta-analysis. ***Frontiers in Cell and Developmental Biology***, 9:734046. https://doi.org/10.3389/fcell.2021.734046
- Han, S, & **Ku, Y*** (2021). Mnemonic attention in analogy to perceptual attention: harmony but not uniformity. ***Psychological Research***, 1–23. http://doi.org/10.1007/s00426-021-01556-9
- Hao, Y.#, Li, X.#, Zhang H. *, & **Ku Y*** (2021). Free-recall benefit, inhomogeneity and between-item interference in working memory. ***Cognition***, 214:104739. https://doi.org/10.1016/j.cognition.2021.104739
- Wang, Y., Chen, J., & **Ku Y*** (2021). Subliminal affective priming effect: Dissociated processes for intense versus normal facial expressions. ***Brain and Cognition***, 148, 105674.
- Lu, Z, & **Ku Y*** (2020). NeuroRA: A Python Toolbox of Representational Analysis From Multi-Modal Neural Data. ***Frontiers in Neuroinformatics***, 14, 99–15.
- Li G, Wu R, Tong R, Bo B, Zhao Y, Gillen KM, Spincemaillle P, **Ku Y**, Du Y, Wang Y, Wang X, Li J. (2020) Quantitative Measurement of Metal Accumulation in Brain of Patients with Wilson' s Disease. ***Movement Disorders***, 35(10), 1787–1795.
- Wang S, Itthipuripat S* & **Ku Y*** (2020). Encoding strategy mediates the effect of electrical stimulation over posterior parietal cortex on visual short-term memory. ***Cortex***, 128, 203–217.
- **Ku Y** *, Yuan T * (2020). “Transient” or “Persisitent” coding for working memory. ***Neuroscience Bulletin***, 14, 477.
- Zhao, Y., Kuai, S., Zanto, T. P., & **Ku Y** * (2020). Neural Correlates Underlying the Precision of Visual Working Memory. ***Neuroscience***, 425, 301–311.
- Cai Y, Mao Y, **Ku Y***, Chen J* (2020). Holistic integration in the processing of Chinese characters

as revealed by EEG frequency tagging. ***Perception***, 49(6), 658–671.

- Wang S#, Itthipuripat S#, and **Ku Y***, (2019) Electrical stimulation over human posterior parietal cortex selectively enhances the capacity of visual short-term memory. ***Journal of Neuroscience***. 39(3):528-536.
- Li G, Zhai G, Zhao X, An H, Spincemaille P, Gillen K, **Ku Y,** Wang Y, Huang D, Li J, (2019) 3D texture analyses within the substantia nigra of Parkinson's disease patients on quantitative susceptibility maps and R2* maps. ***NeuroImage***. 188:465-472.
- Deng, X, Sang, B*, **Ku Y***, & Sai, L (2019). Age-Related Differences in the Late Positive Potential during Emotion Regulation between Adolescents and Adults. ***Scientific Reports***, 9(1)5738.
- Ma, T., Sun, Y., and **Ku, Y**. (2019). Effects of Non-invasive Brain Stimulation on Stimulant Craving in Users of Cocaine, Amphetamine, or Methamphetamine: A Systematic Review and Meta-Analysis. ***Frontiers in Neuroscience***, 13, 357. http://doi.org/10.3389/fnins.2019.01095.s002
- Shen, F., Chen, X., Li, J., Cao, W., **Ku, Y.**, Wu, J., Cui, Y., Wang, Z., Wang, H. and Kwok, S.C. (2019). Mnemonic vulnerability induced by post-activation time-dependent new-learning. ***Neurobiology of Learning and Memory***, 164:107047.
- Zhao D, Zhou Y, Bodner M, **Ku Y***, (2018) The Causal Role of the Prefrontal Cortex and Somatosensory Cortex in Tactile Working Memory. ***Cerebral Cortex***. 28(10):3468-3477.
- Zhao D, **Ku Y***, (2018) Dorsolateral prefrontal cortex bridges bilateral primary somatosensory cortices during cross-modal working memory. ***Behvioural Brain Research***. 350:116-121.
- Gui P [#], Li J [#], **Ku Y** [#], Li L, Li, X, Zhou X, Bodner M, Lenz FA, Dong XW, Wang L, Zhou YD (2018). Neural Correlates of Feedback Processing in Visuo-Tactile Crossmodal Paired-Associate Learning. ***Frontiers in Human Neuroscience***, 12, 266.
- **Ku Y***, (2018) Selective attention on representations in working memory: cognitive and neural mechanisms. ***PeerJ***. 6:e4585
- Zhang Y, Wang Y, **Ku Y***, (2018) Hypnotic and non-hypnotic suggestion to ignore pre-cues decreases space-valence congruency effects in highly hypnotizable individuals. ***Consciousness and Cognition***, 65, 293–303.
- Gui P[#], **Ku Y**[#], Li L, Li X, Bodner M, Lenz FA, Wang L, Zhou YD (2017). Neural correlates of visuo-tactile crossmodal paired-associate learning and memory in humans. ***Neuroscience***. 362(24):181-195.
- Wang M, Hao N*, **Ku Y***, Grabner RH, & Fink A, (2017) Neural correlates of serial order effect in verbal divergent thinking. ***Neuropsychologia***, 99, 92-100.
- Pan Y, Li X, Chen X, **Ku Y**, Dong Y, Dou Z, He L, Hu Y, Li W, Zhou X, (2017) ERPs and oscillations during encoding predict retrieval of digit memory in superior mnemonists. ***Brain and Cognition***. 117:17-25.
- Ericsson KA, Cheng XJ, Pan YF, **Ku Y**, Ge Y, Hu Y*. (2017). Memory skills mediating superior memory in a world-class memorist. ***Memory***. 25(9):1294-1302.
- Civile C, Verbruggen F, McLaren R, Zhao D, Ku Y, McLaren IPL, (2016) Switching off perceptual learning: Anodal tDCS to left DLPFC eliminates perceptual learning in humans. ***Journal of Experimental Psychology: Animal Behavior Processes***. 42(3):290-296.
- Hao N, **Ku Y**[#], Liu M, Hu Y, Bodner M, Grabner RH, Fink A, (2016). Reflection enhances creativity: Beneficial effects of idea evaluation on idea generation. ***Brain and Cognition***. 103:30-37.
- Wang L, Gui P, Li L, **Ku Y**, Bodner M, Fan G, Zhou Y-D, and Dong X, (2016) Neural correlates of heat-evoked pain memory in humans. ***Journal of Neurophysiology.*** 115(3):1596-1604.

- **Ku Y** *, Zhao D, Bodner M, and Zhou Y-D, (2015) Cooperative processing in primary somatosensory cortex and posterior parietal cortex during tactile uni-modal working memory. ***European Journal of Neuroscience***. 42(3):1905-1911.
- Hsu WY, **Ku Y**, Zanto T, Gazzaley A, (2015) Effects of non-invasive brain stimulation on cognitive function in healthy aging and Alzheimer's disease: a systematic review and meta-analysis. ***Neurobiology of Aging***. 36(8):2348-2359.
- **Ku Y***, Feature-based and object-based attention orientation during short-term memory maintenance. ***Journal of Neurophysiology***. 114(6):3036-3038.
- **Ku Y***, Zhao D, Hao N, Hu Y, Bodner M, and Zhou Y-D, (2015) Sequential Roles of Primary Somatosensory Cortex and Posterior Parietal Cortex in Tactile-Visual Cross-modal Working Memory: A Single-pulse Transcranial Magnetic Stimulation (spTMS) Study. ***Brain Stimulation***. 8(1):88-91.
- **Ku Y***, van Schouwenburg M, (2015) Explaining attention-related changes in behavior and electroencephalography data through computational modeling, ***Journal of Neurophysiology***. 114(4):2087-2089.
- Sai L, Wang S, **Ku Y***, Sang B *, (2015) Individual Differences in the Habitual Use of Cognitive Reappraisal Predict the Reward-related Feedback Negativity, ***Frontiers in Psychology***. 6:1256.
- Li X, Cheng X, Li J, Pan Y, Hu Y, **Ku Y***, (2015) Examination of Mechanisms Underlying Enhanced Memory Performance in Action Video Game Players: A Pilot Study, ***Frontiers in Psychology***. 6:843.
- **Ku Y***, Bodner M, and Zhou Y-D. (2015) Prefrontal Cortex and Sensory Cortices during Working Memory: Quantity and Quality. ***Neuroscience Bulletin***. 31(2): 175-182.
- Hao N, Liu M, **Ku Y**, Hu Y, & Runco MA (2015) Verbal divergent thinking facilitated by a pleasurable incubation interval. ***Psychology of Aesthetics, Creativity, and the Arts***. 9:286-295.
- Hao, N, **Ku Y**[#], Liu M, Hu Y, Grabner RH, & Fink A, (2014) Enhancing verbal creativity via brief interventions during an incubation interval. ***Creativity Research Journal***, 26(1):30-38.
- Civil C, Zhao D, **Ku Y**, Heike H, Lavric A, McLaren I.P.L., (2014) Perceptual Learning and Inversion Effects: Recognition of Prototype-Defined Familiar Checkerboards. ***Journal of Experimental Psychology: Animal Behavior Processes***, 40(2):144-161.
- **Ku Y***, Hong B, Zhou W, Bodner M, Zhou Y-D (2012) Sequential Neural Processes in Abacus Mental Addition: An EEG and fMRI Case Study. ***PLoS ONE*** 7(5): e36410.
- **Ku Y***, Hong B, Gao X, Gao S, (2010) Spectra-temporal patterns underlying mental addition: an ERP and ERD/ERS study. ***Neuroscience Letters***, 472(1):5-10.
- Ohara S, Wang L, **Ku Y**, Lenz FA, Hsiao SS, Hong B, Zhou YD, (2008) Neural activities of tactile cross-modal working memory in humans: an event-related potential study. ***Neuroscience*** 152(3): 692-702.
- **Ku Y**, Ohara S, Wang L, Lenz FA, Hsiao SS, Hong B, Zhou Y-D. (2007) Prefrontal Cortex and Somatosensory Cortex in Tactile Crossmodal Association: An Independent Component Analysis of ERP Recordings. ***PLoS ONE*** 2(8): e771.

Peer-reviewed Publications in Chinese (Psychological Abstract & PsychINFO indexed)

- Liu Z, **Ku Y ***, (2017) Perceiving better, inhibiting better: Effects of perceptual precision on distractor-inhibition processes during working memory. *Acta Psychologica Sinica* 49 (10): 1247-1255.
- Wang S, **Ku Y ***, (2018) The Causal Role of Right Dorsolateral Prefrontal Cortex in Visual Working Memory. *Acta Psychologica Sinica* 50 (7): 727-738.

- **Ku, Y.** (2019). Cognitive and neural mechanisms underlying working memory. *Acta Physiologica Sinica* 71(1), 173-185.
- Li W, **Ku Y ***, (2020) The influence of acute stress on working memory: Physiological and psychological mechanisms. *Advances in Psychological Science* 28 (9), 1508-1524.

Conference paper

- Zhao, Y., Ran, X., Zhang, L., Zhang, R., & Ku Y* (2019). T202. Atypically Larger Variability of Resource Allocation Accounts for Visual Working Memory Deficits in Schizophrenia. Biological Psychiatry, 85(Supplement), S208–S209.
- Zhao, Y., Ran, X., Zhang, L., Zhang, R., & Ku Y* (2019). S172. Elevated Distractibility of Schizophrenia in Visual Working Memory. Biological Psychiatry, 85(Supplement), S363–S364.
- Wang S, Ku Y*, (2019) Electrical Stimulation over Posterior Parietal Cortex Enhances Distractor Filtering and Target Maintenance in Visual Working Memory. Brain Stimulation. 12(2):105-107.

Teaching Experience:

Sun Yat-sen University

Undergraduate Courses

Biological Psychology	2021 Fall
	2021 Spring
	2020 Fall
Psychophysiology	2021 Spring
Biological Psychology	2020 Fall
History of Psychology	2021 Spring
	2020 Spring

Graduate Courses

Cognitive Neuroscience	2021 Fall
Perception, Learning and Plasticity	2020 Fall

East China Normal University

Undergraduate Courses

Biological Psychology	2018 Fall
	2017 Fall
	2016 Fall
	2016 Spring
Experimental Psychology: Design and Application	2015 Fall
	2016 Spring
Methods in Psychology	2015 Spring
Literatures Searching and Scientific Papers Writing	2013 Spring

Graduate Courses

Methods in Cognitive Neuroscience	2018 Fall
	2017 Fall
	2016 Spring
	2013 Spring
Frontiers in Cognitive Neuroscience	2019 Spring
	2018 Spring

	2017 Spring
Learning and Creativity	2015 Fall
Cognitive Neuroscience	2012 Fall
Literatures Searching and Scientific Papers Writing	2015 Spring
	2015 Fall
	2016 Spring

Professional Activities:

Journal editor

- Advance in Psychological Science (in Chinese) Editorial Board
- Frontiers in Human Neuroscience (Reviewing Editor)

Journal ad-hoc reviewer:

- Acta Psychogica
- Biological Psychology
- Brain Research
- Cerebral Cortex
- Cortex
- Frontiers in Human Neuroscience
- IEEE Signal Processing Letters
- IEEE Transactions on Affective Computing
- IEEE Transactions on Neural Systems and Rehabilitation Engineering
- International Journal of Psychophysiology
- Journal of Neuroscience
- NeuroImage
- Neuropyschologia
- Neuroscience Bulletin
- Psychophysiology

Grant ad-hoc reviewer:

National Science Foundation of USA (NSF)	2013
Natural Science Foundation of China (NSFC)	2012-present

Professional Memberships:

Chinese Association of Psychology Section of EEG and other methods	Committee member
Chinese Association of Physiology Translational Neuroscience	Committee member
Guangdong Association of Cognitive Science	Executive member of the council
American Psychological Society	Member
Cognitive Neuroscience Society	Member
Organization of Human Brain Mapping	
Society for Neuroscience	Member
Society for Neuroscience of China	Member