

Atsushi Kikumoto (菊本 篤史)

Department of Cognitive, Linguistic, Psychological Sciences, Brown University

190 Thayer Street, Providence, RI 02906

atsushi_kikumoto@brown.edu

Education

- | | |
|-------------|---|
| 2013 – 2020 | PhD, Psychology and Cognitive Neuroscience
University of Oregon, Eugene, OR
Adviser: Ulrich Mayr |
| 2009 – 2012 | Bachelor of Science, Psychology (honors), Biology (minor),
University of Oregon, Eugene, OR
Adviser: Ulrich Mayr, Ed Vogel, Margaret Sereno |
| 2008 – 2010 | The Associate of Arts Oregon Transfer (AAOT),
Lane Community College, Springfield, OR |

Employment and Research Experience

- | | |
|----------------|---|
| 2020 – present | Postdoctoral Research Associate (Dean's Faculty Fellowship)
JSPS Overseas Fellow
Brown University, Providence, RI, United States
Adviser: David Badre |
| 2021 – present | Postdoctoral Researcher
Visiting Scholar
RIKEN Center for Brain Science, Wako, Saitama, Japan
Adviser: Kazuhisa Shibata |
| 2010 – 2020 | PhD Graduate Student Researcher
University of Oregon, Eugene, OR, United States
Adviser: Ulrich Mayr |
| 2018 | Visiting Junior Scholar
Max Planck Institute of Human Development, Berlin, Germany
Director: Ulman Lindenberger, Markus Werkle-Bergner, and Myriam Sander |
| 2010 – 2012 | Research assistant
University of Oregon, Eugene, OR, United States
Adviser: Ed Vogel |
| 2010 – 2012 | Research assistant
University of Oregon, Eugene, OR, United States
Adviser: Margaret Sereno |

Grant Support

- 2021-2026 NIH (NIMH) R01 Grant, Human prefrontal representational geometry and cognitive control function. (Role: Co-Investigator; PI: David Badre, Stefano Fusi & Ulrich Mayr)
- 2017-2022 NSF R01 Grant, Hierarchical control of sequential skills: Using EEG to decode the underlying representations. (PI: Ulrich Mayr)

Research papers (* denotes that authors contributed equally to the work)

Kikumoto, A., Mayr, U., Badre, D. (in press) The role of conjunctive representations in prioritizing and selecting planned actions. *eLife*, 11. doi:e80153

Kikumoto, A., Sameshima, T., & Mayr, U. (2022). The Role of Conjunctive Representations in Stopping Actions. *Psychological Science*, 9567976211034505.

Badre, D., Bhandari, A., Keglovits, H., & **Kikumoto, A.** (2021). The dimensionality of neural representations for control. *Current Opinion in Behavioral Sciences*, 38, 20–28.

Kikumoto, A., & Mayr, U. (2020). Conjunctive representations that integrate stimuli, responses, and rules are critical for action selection. *Proceedings of the National Academy of Sciences of the United States of America*. <https://doi.org/10.1073/pnas.1922166117>

Sereno, M. E., Robles, K. E., **Kikumoto, A.**, & Bies, A. J. (2020). The Effects of Three-Dimensional Context on Shape Perception. *Psychological Science*, 956797620901749.

Moss, M. E., **Kikumoto, A.**, & Mayr, U. (2020). Does conflict resolution rely on working memory? *Journal of Experimental Psychology. Learning, Memory, and Cognition*.

Kikumoto, A., & Mayr, U. (2019). Balancing model-based and memory-free action selection under competitive pressure. *eLife*, 8.

Hubbard, J*, **Kikumoto, A***, & Mayr, U. (2019). EEG Decoding Reveals the Strength and Temporal Dynamics of Goal-Relevant Representations. *Scientific Reports*, 9(1), 9051.

Kikumoto, A., & Mayr, U. (2018). Decoding hierarchical control of sequential behavior in oscillatory EEG activity. *eLife*, 7.

Kikumoto, A., & Mayr, U. (2017). The nature of task set representations in working memory. *Journal of Cognitive Neuroscience*, 29(11), 1950–1961.

Kikumoto, A., Hubbard, J., & Mayr, U. (2015). Dynamics of task-set carry-over: evidence from eye-movement analyses. *Psychonomic bulletin & review*, 1-8.

Mayr, U., Kleffner-Canucci, K., **Kikumoto, A.**, & Redford, M.A. (2014), Control of task sequences: What is the role of language? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 40(2).

Manuscripts

Tsubomi, H., Fukuda, K., **Kikumoto, A.**, Mayr, U., & Vogel, E (in prep). Task termination triggers spontaneous clearance of visual working memory.

Kikumoto, A., Bhandari, A., Shibata, K. & Badre, D (in prep). Temporally stable and high-dimensional geometry leads to efficient action selection.

Kikumoto, A., Bhandari, A., Shibata, K., Nishio, T. & Badre, D (in prep). Effects of practice and consolidation on the geometry of task representations.

Kikumoto, A., Bhandari, A., Shibata, K. & Badre, D (in prep). Integration of salient task-irrelevant inputs facilitate action selection.

Conference Talks and Symposia

Kikumoto, A., Bhandari, A., Mayr, U., Shibata, K., & Badre, D. (2022). “Stability and dimensionality of action representations during selection”. Control Processes, May 2022, Virtual meeting, USA.

Kikumoto, A. & Mayr, U. (2019). “The role of conjunctive representations in stopping actions”. Psychonomic Society, November 2019, Montreal, QC, Canada.

Kikumoto, A. & Mayr, U. (2019). “Conjunctions between rules and stimulus-response codes drive action selection”. Control Processes, May 2019, Providence, RI, USA.

Kikumoto, A. & Mayr, U. (2018). “The nature of rule-based action selection”. Psychonomic Society, November 2018, New Orleans, LA, USA.

Kikumoto, A. & Mayr, U. (2018). “Probing the nature of task-set representations”. Presentation for Experimental Psychology Society, January 2018, London, UK.

Kikumoto, A. & Mayr, U. (2017). “Competitive task switching: balancing model-based and memory-free action selection”. Psychonomic Society, November 2017, Vancouver, BC, Canada.

Kikumoto, A. & Mayr, U. (2014). “Using the contralateral delay activity to probe the nature of task set representations”, Presentation for the Psychonomic Society, November 2014, Long Beach, CA, USA.

Dungan, J.B., **Kikumoto, A.** & Vogel, E.K. (2012). "Stability of visual working memory representations across changes in eye positions", Presentation for the Cognitive Science Association for Interdisciplinary Learning (CSAIL), August 2012, Hood River, OR, USA.

Other Conference Abstracts

Kikumoto, A., Sameshima, T. & Mayr, U. (2019). "How does stopping of actions affect action-relevant representations?", Poster for the Cognitive Neuroscience Society, March 2019, San Francisco, CA, USA.

Kikumoto, A., Sameshima, T. & Mayr, U. (2018). "Sticky rules: conjunctions between rules and stimulus-response Codes Drive Action Selection", Poster for the Cognitive Neuroscience Society, March 2018, Boston, MA, USA.

Tsubomi, H., Fukuda, K., **Kikumoto, A.**, Mayr, U. & Vogel, E. (2018). "Removal of no-longer necessary items from working memory after task accomplishment", Poster for the Psychonomic Society, November 2015, Louisiana, LA, USA.

Moss, M., **Kikumoto, A.** Mayr, U. (2018). "Efficient coding of abstract inter-chunk relationship", Poster for the Psychonomic Society, November 2015, Louisiana, LA, USA.

Kikumoto, A., Corona,C., Karpf, J. & Mayr, U. (2017). "Towards optimal competitive behavior: wins versus losses determine model-based versus random choices in competitive task switching", Poster for the Cognitive Neuroscience Society, March 2017, San Francisco, CA, USA.

Moss, M., **Kikumoto, A.** & Mayr, U. (2017). "Do working memory and conflict resolution share common cognitive resources", Poster for the Cognitive Neuroscience Society, March 2017, San Francisco, CA, USA.

Bies, A., **Kikumoto, A.**, Lazarides, S., & Sereno, M. (2017). "Shape constancy in anaglyphs: Effects of angle, context and instruction", Poster for Vision Science Society, May 2017, FL, USA.

Kikumoto, A., Schäfer, T., Sameshima, T., Anderson, D., McGuirk, W. & Mayr, U. (2016). "Mapping out the representational space for decision using EEG delta oscillations", Poster for the Cognitive Neuroscience Society, November 2016, NewYork, NY, USA.

Morales, P.J., Hubbard, J., **Kikumoto, A.** & Mayr, U. (2016). "Probability contexts modulate mediofrontal prediction error signals in response to gains and losses". Poster for the Cognitive Neuroscience Society, November 2016, NewYork, NY, USA.

Bies, J. A., **Kikumoto, A.**, Boydstonb, R., Greenfielda. A., Chauvina, A., Taylor. R., & Sereno, M., (2016). "Percepts from noise patterns: The role of fractal dimension in object pareidolia", Poster for Vision Science Society, May 2016, FL, USA.

Kikumoto, A., Corona,C., Sameshima, T. & Mayr, U. (2015). "Decoding hierarchical representations of complex sequences from EEG oscillatory activity", Poster for the Psychonomic Society, November 2015, Chicago, IL, USA.

Tsubomi, H., Fukuda, K., **Kikumoto, A.** & Vogel, E. (2015). “Forgetting no-longer necessary items from visual working memory”, Poster for the Psychonomic Society, November 2015, Chicago, IL, USA.

Jost, K., Mayr, U., **Kikumoto, A.** & Schwarzkopp, T. (2015). “Visual working memory and filtering out distractors: evidence for an age-specific delay in filtering”. Poster for the Cognitive Neuroscience Society, May 2015, San Francisco, CA, USA.

Kikumoto, A., Williams, L., Robson, S. & Mayr, U. (2014). “Using the contralateral delay activity to probe the nature of task set representations”, Poster for the Cognitive Neuroscience Society, March 2015, San Francisco, CA, USA.

Hubbard, J., **Kikumoto, A.** & Mayr, U. (2014). “Pupillometric indicator of proactive control in task-switching”, Poster for the Psychonomic Society, November 2014, Long Beach, CA, USA.

Dungan, J.B., **Kikumoto, A.** & Vogel, E.K. (2012). “Stability of visual working memory representations across changes in eye positions”, Poster for the Society for the Neuroscience (SfN), August 2012, New Orleans, LA, USA.

Dungan, J.B., **Kikumoto, A.** & Vogel, E.K., (2012). “Stability of visual working memory representations across changes in eye positions”, Poster for the Society for the Neuroscience (SfN), August 2012, New Orleans, LA.

Kikumoto, A. & Mayr, U. (2011). “Passive listening to music engages executive control”, Poster for the NorthWest Cognition & Memory (NOWCAM), May 2011, Vancouver, BC, USA.

Invited Talks

Kikumoto, A., Bhandari, A., Shibata, K., Mayr, U., Badre D. (2021, Nov). “Dynamic Integrated representations during action selection”, Presentation at University of Washington, Missouri, U.S.

Kikumoto, A., Badre D., Mayr, U. (2020, May). “The content and format of control representation during dynamic action control”, Presentation at University of California Berkeley, California, U.S.

Kikumoto, A., Byers A., Mayr, U. (2018, April). “Towards optimal competitive behavior: wins versus losses determine model-based versus random choices in competitive task switching”, Presentation at University of Kansei Gakuin, Kyoto, Japan.

Kikumoto, A., Tsubomi, H., Fukuda, K. & Mayr, U. (2017, August). “Tracking individual representation in visual working memory”, Presentation at Max Planck Research Institute for Human Development, July 2017, Berlin, Germany.

Kikumoto, A., & Mayr, U. (2013, August). “Nature of task set carry-over”, Primate Research Institute Kyoto University, Kyoto, Japan.

Awards, Scholarships, and Fellowships

2021: JSPS Overseas Fellowships (Japan Society for Promotion of Science, \$12,556,000)
 2019: Graduate Student Travel Award (University of Oregon, \$500)
 2018: Pre-doctoral stipend of Max Planck Society (Max Planck Institute of Human Development)
 2017: Gregores Research Award (University of Oregon, \$500)
 2014: Graduate Student Award for the Cognitive Neuroscience Society
 2011: Best Poster Presentation Award for the Northwest Cognitive & Memory
 2009: International Deans Excellence Award Scholarship (University of Oregon, \$24,000)
 2008: Shining Star Scholarship (Lane Community College, \$1000)

Teaching

2022	BrainStorm Computational Modeling in EEG workshop and Datathon, Tutor
2017	PSY302: Statistical method, Teaching assistant and lab instructor
2016	PSY449/549: Human Neuropsychology, Teaching assistant
2016	PSY438/538: Perception, Teaching assistant and guest lecturer
2015	PSY436/536: Human performance, Teaching assistant
2014	PSY202: Mind and Brain, Teaching assistant
2008 – 2010	Psychology tutor with the CRLA Advanced level tutor certificate

Supervision and Mentoring

2020 – 2021	Brown University: Defne Buyukyazgan
2020 – 2021	RIKEN Center of Brain Science: Narumi Sugihara, Sara Matsui
2013 – 2019	University of Oregon: Chihoko Hayashi, Lauren Williams, Selina Robson, Dagger Anderson, Caitlin Corona, Megan Carson, Tesufuai Sameshima, Ali Byers, Izabella Dickerson, Min Zhang, Jiafan Jia, Vy Tran

Mentored or co-mentored the following thesis projects:

2020-2021	Clark honors college thesis: Is Competitive Pressure Necessary for Loss-Induced Random Behavior? (Ali Byers), University of Oregon, USA
2018-2019	Departmental honor thesis: Is Efficient Coding a Cognitive Primitive of Working-Memory Capacity? (Izabella Dickerson), University of Oregon, USA
2018-2019	Departmental honor thesis: The Effect of Abstract Chunk Patterns on Sequential Performance (Min Zhang), University of Oregon, USA
2016-2017	Departmental honor thesis: The Modulation of Perceptual Weights Facilitated by the Expectations of Forthcoming Evidence (Tesufuai Sameshima), University of Oregon, USA
2016-2017	McNair research program (Megan Carson), University of Oregon, USA

- 2015-2016 Departmental honor thesis: Musical Boundaries and Task Switching (Caitlin Corona), University of Oregon, USA
- 2014-2015 Departmental honor thesis: Is There a Spatial Code in Abstract Sequences? (Dagger Anderson), University of Oregon, USA
- 2011-2012 Departmental honor thesis: Competition, Inhibition, and Voluntary Task Control (Chihoko Hayashi), University of Oregon, USA

Ad Hoc Journal Reviewing

Cognition, Psychonomic Bulletin & Review, Neuron, eLife, Journal of Neuroscience, Journal of Cognitive Neuroscience

Training

2018: fsl course for neuroimaging analysis at University of Oxford

2017: Model-based neuroscience summer school at University of Amsterdam