Marcelo G. **Mattar**

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Employment

Princeton University *Princeton, NJ, USA*

Postdoctoral Research Associate *Sep. 2016 - Present*

- Department: Princeton Neuroscience Institute
- Advisor: Nathaniel Daw

Education

University of Pennsylvania *Philadelphia, PA, USA*

Ph.D. Psychology *2016*

- Advisors: Dr. Danielle S Bassett, Dr. Geoffrey K Aguirre, Dr. Sharon L Thompson-Schill
- Funding: NIH; Benjamin Franklin Fellowhip; Fundacao Estudar
- Thesis: *Visual adaptation as it varies across timescales, neural populations, and individuals*

University of Pennsylvania *Philadelphia, PA, USA*

M.A. Statistics *2016*

- Advisor: Dr. Dylan S Small
- Funding: NIH; Benjamin Franklin Fellowhip; Fundacao Estudar
- Thesis: *Nonparametric approaches for statistical inference in multislice network models*

University of Pennsylvania *Philadelphia, PA, USA*

M.A. Psychology *2011*

- Advisors: Dr. Michael K Kahana, Dr. Geoffrey K Aguirre, Dr. Russell A Epstein
- Funding: NIH; Benjamin Franklin Fellowhip; Fundacao Estudar

Aeronautics Institute of Technology *Sao Jose dos Campos, SP, Brazil*

B.A. Electronics Engineering *2009*

- Advisors: Dr. Takashi Yoneyama
- Funding: Brazilian Air Force

Awards & Achievements

2018	**Travel grant**, Cosyne 2018	*Denver, CO, USA*
2015	**Fellowship**, Summer Institute in Cognitive Neuroscience	*USA*
2014	**Best poster award**, Repetition Suppression Summer School	*Jena, Germany*
2014	**Scholarship**, Repetition Suppression Summer School	*Jena, Germany*
2011	**Scholarship**, The Brain Fund	*Sao Paulo, SP, Brazil*
2010	**Fellowship**, Fundacao Estudar	*Sao Paulo, SP, Brazil*
2010	**Fellowship**, Benjamin Franklin	*USA*
2008	**Scholarship**, Computational Neuroscience Summer School	*USA*

Additional training

Marine Biological Laboratory *Woods Hole, MA, USA*

Methods in Computational Neuroscience *Summer 2016*

University of California, Santa Barbara *Santa Barbara, CA, USA*

Summer Institute in Cognitive Neuroscience *Summer 2015*

University of Jena *Jena, Germany*

Repetition Suppression Summer School *Summer 2014*

University of Pennsylvania *Philadelphia, PA, USA*

Computational Neuroscience Summer School *Summer 2009*

Massachussetts Institute of Technology *Cambridge, MA, USA*

Visiting Student - Brain and Cognitive Sciences *Fall 2009*

Peer-review contribution

- Neuroimage
- PLoS Computational Biology
- Cerebral Cortex
- Nature Scientific Reports
- Human Brain Mapping
- Biomedical Signal Processing Control

Publications

Submitted manuscripts

[1] ***Mattar, Marcelo G**, *Olkkonen, Maria, Epstein, Russell A, and Aguirre, Geoffrey K. Adaptation decorrelates shape representations. *bioRxiv*, page 249045, 2018.

[2] **Mattar, Marcelo G** and Daw, Nathaniel D. Prioritized memory access explains planning and hippocampal replay. *bioRxiv*, page 225664, 2018.

[3] **Mattar, Marcelo G**, Carter, Marie V, Zebrowitz, Marc S, Thompson-Schill, Sharon, and Aguirre, Geoffrey K. Individual differences in response precision correlate with adaptation bias. *bioRxiv*, page 285973, 2018.

[4] Tang, Evelyn, **Mattar, Marcelo G**, Giusti, Chad, Thompson-Schill, Sharon L, and Bassett, Danielle S. Effective learning is accompanied by increasingly efficient dimensionality of whole-brain responses. *arXiv preprint arXiv:1709.10045*, 2017.

Published manuscripts

[1] Reddy, Pranav G, **Mattar, Marcelo G**, Murphy, Andrew C, Wymbs, Nicholas F, Grafton, Scott T, Satterthwaite, Theodore D, and Bassett, Danielle S. Brain state flexibility accompanies motor-skill acquisition. *NeuroImage*, 171:135–147, 2018.

[2] **Mattar, Marcelo G**, Wymbs, Nicholas F, Bock, Andrew S, Aguirre, Geoffrey K, Grafton, Scott T, and Bassett, Danielle S. Predicting future learning from baseline network architecture. *NeuroImage*, 172:107–117, 2018.

[3] **Mattar, Marcelo G**, Thompson-Schill, Sharon L, and Bassett, Danielle S. The network architecture of value learning. *Network Neuroscience*, (Just Accepted):1–27, 2018.

[4] Khambhati, Ankit N, **Mattar, Marcelo G**, Wymbs, Nicholas F, Grafton, Scott T, and Bassett, Danielle S. Beyond modularity: Fine-scale mechanisms and rules for brain network reconfiguration. *NeuroImage*, 166:385–399, 2018.

[5] Kahn, Ari E, **Mattar, Marcelo G**, Vettel, Jean M, Wymbs, Nicholas F, Grafton, Scott T, and Bassett, Danielle S. Structural pathways supporting swift acquisition of new visuomotor skills. *Cerebral cortex*, 27(1):173–184, 2017.

[6] Gu, Shi, Betzel, Richard F, **Mattar, Marcelo G**, Cieslak, Matthew, Delio, Philip R, Grafton, Scott T, Pasqualetti, Fabio, and Bassett, Danielle S. Optimal trajectories of brain state transitions. *Neuroimage*, 148:305–317, 2017.

[7] Bassett, Danielle S and **Mattar, Marcelo G**. A network neuroscience of human learning: potential to inform quantitative theories of brain and behavior. *Trends in cognitive sciences*, 21(4):250–264, 2017.

[8] Ashourvan, Arian, Gu, Shi, **Mattar, Marcelo G**, Vettel, Jean M, and Bassett, Danielle S. The energy landscape underpinning module dynamics in the human brain connectome. *Neuroimage*, 157:364–380, 2017.

[9] ***Mattar, Marcelo G**, *Kahn, David A, Thompson-Schill, Sharon L, and Aguirre, Geoffrey K. Varying timescales of stimulus integration unite neural adaptation and prototype formation. *Current Biology*, 26(13):1669–1676, 2016.

[10] ***Mattar, Marcelo G**, *Betzel, Richard F, and Bassett, Danielle S. The flexible brain. *Brain*, 139(8):2110–2112, 2016.

[11] Kahn, Ari E, **Mattar, Marcelo G**, Vettel, Jean M, Wymbs, Nicholas F, Grafton, Scott T, and Bassett, Danielle S. Structural pathways supporting swift acquisition of new visuomotor skills. *Cerebral cortex*, 2016.

[12] Chai, Lucy R, **Mattar, Marcelo G**, Blank, Idan Asher, Fedorenko, Evelina, and Bassett, Danielle S. Functional network dynamics of the language system. *Cerebral Cortex*, 26(11):4148–4159, 2016.

[13] *Pegors, Teresa K, ***Mattar, Marcelo G**, Bryan, Peter B, and Epstein, Russell A. Simultaneous perceptual and response biases on sequential face attractiveness judgments. *Journal of Experimental Psychology: General*, 144(3):664–673, 2015.

[14] **Mattar, Marcelo G.**, Cole, Michael W., Thompson-Schill, Sharon L., and Bassett, Danielle S. A functional cartography of cognitive systems. *PLoS Comput Biol*, 11(12):e1004533, 12 2015.

[15] Wyble, Brad, Potter, Mary C, and **Mattar, Marcelo G**. Rsvp in orbit: Identification of single and dual targets in motion. *Attention, Perception, & Psychophysics*, 74(3):553–562, 2012.

[16] Aguirre, Geoffrey Karl, **Mattar, Marcelo G**, and Magis-Weinberg, Lucía. de bruijn cycles for neural decoding. *NeuroImage*, 56(3):1293–1300, 2011.

Book chapters

[1] **Mattar, Marcelo G** and Bassett, Danielle S. Brain network architecture: Implications for human learning. 2016.

[2] Yaden, David B, Anderson, Derek E, **Mattar, Marcelo G**, and Newberg, Andrew B. Psychoactive substances & psychoactive stimulation: Conceptual and ethical considerations. In Ellens, J H and Roberts, T J, Editors, *A Psychedelic Policy Quagmire: Health, Law, Freedom, and Society*. Praeger, 2014.

Conferences

Conference abstracts

[1] **Mattar, Marcelo G** and Daw, Nathaniel D. A rational model of prioritized experience replay, 2017. Poster presented at The 3rd Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM), June 11-14, 2017, Ann Arbor, MI, USA.

[2] Khambhati, Ankit N, **Mattar, Marcelo G**, and Bassett, Danielle S. Non-negative matrix factorization uncover topological modes of dynamic brain networks, 2017. Poster presented at Organization for Human Brain Mapping (OHBM), June 25-29, 2017, Vancouver, BC, Canada.

[3] Bock, Andrew S, Benson, Noah C, **Mattar, Marcelo G**, and K, Aguirre Geoffrey. Template fitting to automatically derive v1-v3 retinotopy from inter-areal functional correlations, 2016. Poster presented at the Vision Sciences Society (VSS), May 14-19, 2016, St Petersburg, FL, USA.

[4] Olkkonen, Maria, **Mattar, Marcelo G**, Aguirre, Geoffrey, and Epstein, Russell. Adaptation sharpens object representations: Evidence from shape discrimination thresholds., 2015.

[5] **Mattar, Marcelo G**, Wymbs, Nicholas F, Bock, Andrew S, K, Aguirre Geoffrey, Grafton, Scott T, and Bassett, Danielle S. Predicting future learning from baseline network architecture, 2015. Poster presented at Society for Neuroscience (SfN), Oct 17-21, 2015, Chicago, IL, USA.

[6] **Mattar, Marcelo G**, Olkkonen, Maria, Aguirre, Geoffrey, and Epstein, Russell. Adaptation decorrelates object representations: Evidence from multivoxel pattern analysis., 2015.

[7] Chai, Lucy R, **Mattar, Marcelo G**, Blank, Idan A, Fedorenko, Evelina, and Bassett, Danielle S. Functional network dynamics of the language system. Poster presented at Biomedical Engineering Society Annual Meeting (BMES), Oct 7-10, 2015, Tampa, FL, USA, 2015.

[8] Chai, Lucy R, **Mattar, Marcelo G**, Blank, Idan A, Fedorenko, Evelina, and Bassett, Danielle S. Functional network dynamics of the language system. Poster presented at Society for Neuroscience (SfN), Oct 17-21, 2015, Chicago, IL, USA, 2015.

[9] Aguirre, Geoffrey, **Mattar, Marcelo G**, Carter, Marie, and Thompson-Schill, Sharon. Individual differences in representation precision predict adaptation bias., 2015.

[10] Pegors, Teresa, Bryan, Peter, **Mattar, Marcelo G**, and Epstein, Russell. Decoupling perceptual and response biases in a sequential face judgment task. *Journal of Vision*, 14(10):1257–1257, 2014.

[11] ***Mattar, Marcelo G**, *Kahn, David A, and Aguirre, Geoffrey K. A single mechanism of temporal integration unites neural adaptation and norm-based coding. *Journal of Vision*, 14(10):120–120, 2014.

[12] **Mattar, Marcelo G**, Cole, Michael W, Thompson-Schill, Sharon L, and Bassett, Danielle S. A functional cartography of cognitive systems, 2014. Poster presented at Society for Neuroscience (SfN), Nov 15-19, 2014, Washington, DC, USA.

[13] Baker, David, Gu, Shi, Khambha, Ankit, **Mattar, Marcelo G**, Muldoon, Sarah Feldt, Telesford, Qawi, Yang, Muzhi, and Bassett, Danielle S. The network community architecture toolbox (ncat), 2014. Poster presented at Society for Neuroscience (SfN), Nov 15-19, 2014, Washington, DC, USA.

[14] **Mattar, Marcelo G**, Magis-Weinberg, Lucía, and Aguirre, Geoffrey K. De bruijn cycles for neural decoding. *Journal of Vision*, 11(11):848–848, 2011.

Invited talks

2017 International Convention of Psychological Science *Vienna, Austria*