

Michael L. Mack, Ph.D.
Curriculum Vitae

Assistant Professor
University of Toronto
Department of Psychology

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Current Position

Assistant Professor of Psychology 2016-present
University of Toronto, Toronto, ON

Education

Postdoctoral Research Fellow of Cognitive Neuroscience 2011-2016
The University of Texas, Austin, TX
Advisors: Dr. Alison Preston and Dr. Bradley Love

Ph.D. in Psychology - Cognition and Cognitive Neuroscience 2005-2011
Vanderbilt University, Nashville, TN
Dissertation: *The Dynamics of Categorization: Rapid Categorization Unraveled*
Advisor: Dr. Thomas Palmeri

M.S. in Computer Science 2003-2005
Michigan State University, East Lansing, MI
Advisors: Dr. Aude Oliva and Dr. George Stockman

B.S. High Honors in Computer Science 1999-2003
Michigan State University, East Lansing, MI

Research Interests

Cognition and cognitive neuroscience; fMRI; category learning; attention; episodic memory; computational modeling; visual object recognition and categorization; perceptual expertise; scene perception

Honors and Awards

Psychonomic Society Fellow 2018
Best Poster Award, Austin Conference on Learning and Memory 2015
Memory Disorders Research Society Meeting Organizer 2014
Object Perception, Attention, & Memory Conference Organizer 2012-2013
Jum Nunnally Dissertation Award, Vanderbilt University 2011
Vanderbilt Dissertation Enhancement Grant 2011
Temporal Dynamics of Learning Center Trainee Small Grant 2011
Cognitive Science Society Annual Meeting Student Travel Grant 2009
Pat Burns Memorial Student Research Award, Vanderbilt University 2008
Golden Greeble Travel Award, Perceptual Expertise Network 2007
William F. Hodges Teaching Assistant Award, Vanderbilt University 2007
Learning Sciences Institute Fellow, Vanderbilt University 2005-2010

Grants

- 2017-present *Investigating the mutual influence of selective attention and knowledge formation during successful learning*
Natural Sciences and Engineering Research Council Discovery Grant
RGPIN-2017-06753
- 2017-present *Investigating the mutual influence of selective attention and knowledge formation during successful learning*
Canada Foundation for Innovation John R. Evans Leaders Fund
- 2017-present *Investigating the mutual influence of selective attention and knowledge formation during successful learning*
Ontario Research Fund
- 2013-2016 *The mutual influence of attention and learning in acquiring knowledge*
Postdoctoral Ruth L. Kirschstein NRSA, NIMH/NIH
F32 MH100904
- 2015-2016 *Linking hippocampal function to computational models of learning*
The University of Texas at Austin Imaging Research Center Pilot Grant
10022015b

Publications

- Mack, M.L.**, Preston, A.R., Love, B.C. Medial prefrontal cortex compresses concept representations through learning. *Manuscript in revision*.
- Schlichting, M.L., **Mack, M.L.**, Guarino, K.F., & Preston, A.R. Comparison of semi-automated hippocampal subfield segmentation methods in a pediatric sample. *Manuscript in revision*.
- Martinez, J.E., **Mack, M.L.**, Bauer, J.-R., Roe, M.A., Mumford, J.A., Church, J.A. (in press). Developmental interactions among working memory and selective attention during task switching. *Journal of Experimental Psychology: Human Perception and Performance*.
- Mack, M.L.**, Love, B.C., & Preston, A.R. (in press). Building concepts one episode at a time: The hippocampus and concept formation. *Neuroscience Letters*.
- Mack, M.L.**, Preston, A.R., & Love, B.C. (2017). Medial prefrontal cortex compresses concept representations through learning. *Proceedings of the 2017 International Workshop on Pattern Recognition in Neuroimaging (PRNI)*, 1-4.
- Mack, M.L.**, Love, B.C., & Preston, A.R. (2016). Dynamic updating of hippocampal object representations reflects new conceptual knowledge. *Proceedings of the National Academy of Sciences*, 113(46), 13203-13208.
- Martinez, J.E., **Mack, M.L.**, Gelman, B., & Preston, A.R. (2016). Knowledge of Social Affiliations Biases Economic Decisions. *PLoS ONE*, 11(7): e0159918.

- Mack, M.L.** & Preston, A.R. (2016). Decisions about the past are guided by reinstatement of specific memories in the hippocampus and perirhinal cortex. *NeuroImage*, 127, 144-157.
- Mack, M.L.**, & Palmeri, T.J. (2015). The Dynamics of Categorization: Unraveling Rapid Categorization. *Journal of Experimental Psychology: General*, 144(3), 551-569.
- Palmeri, T.J. & **Mack, M.L.** (2015). How Experimental Trial Context Affects Perceptual Categorization. *Frontiers in Psychology*, 6:180, 1-5.
- Shen, J., **Mack, M.L.**, & Palmeri, T.J. (2014). Studying Real-World Perceptual Expertise. *Frontiers in Psychology*, 5:857, 1-6.
- Mack, M.L.**, Preston, A.R., & Love, B.C. (2013). Decoding the brain's algorithm for categorization from its neural implementation. *Current Biology*, 23, 2023-2027.
- Mack, M.L.**, & Palmeri, T.J. (2011). The timing of visual object categorization. *Frontiers in Perception Science*, 2:165, 1-8.
- Mack, M.L.**, Richler, J.J., Gauthier, I., & Palmeri, T.J. (2011). Indecision on decisional separability. *Psychonomic Bulletin & Review*, 18(1), 1-9.
- Richler, J.J., **Mack, M.L.**, Palmeri, T.J., & Gauthier, I. (2011). Inverted faces are (eventually) processed holistically. *Vision Research*, 51(3), 333-342.
- Mack, M.L.**, Richler, J.J., Polyn, S., & Palmeri, T.J. (2010). Modelling effects of object naming on long-term object recognition memory. *Visual Cognition*, 18(10), 1526-1529.
- Mack, M.L.** & Palmeri, T.J. (2010). Decoupling object detection and categorization. *Journal of Experimental Psychology: Human Perception and Performance*, 36(5), 1067-1079.
- Mack, M.L.** & Palmeri, T.J. (2010). Modeling categorization of scenes containing consistent versus inconsistent objects. *Journal of Vision*, 10(3):11, 1-11.
- Richler, J.J., **Mack, M.L.**, Gauthier, I., & Palmeri, T.J. (2009). Holistic processing of faces happens at a glance. *Vision Research*, 49(23), 2856-2861.
- Mack, M.L.**, Wong, A.C.-N., Gauthier, I., Tanaka, J.W., & Palmeri, T.J. (2009). Time-course of visual object categorization: Fastest does not necessarily mean first. *Vision Research*, 49, 1961-1968.
- Castelhano, M.S., **Mack, M.L.**, & Henderson, J.M. (2009). Viewing task influences eye movements during active scene perception. *Journal of Vision*, 9(3):6, 1-15.
- Mack, M.L.** & Palmeri, T.J. (2009). Recognizing scenes containing consistent or inconsistent objects. In N.A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31th Annual Conference of the Cognitive Science Society* (pp. 2528-2533). Austin, TX: Cognitive Science Society.
- Mack, M.L.**, Richler, J.J., Palmeri, T.J., & Gauthier, I. (2009). Categorization. In G.G. Berntson & J.T. Cacioppo (Eds.), *Handbook of Neuroscience for the Behavioral Sciences*. John Wiley & Sons.

- Mack, M.L.**, Sadr, J., Gauthier, I., & Palmeri, T.J. (2008). Object detection and basic-level categorization: Sometimes you know it is there before you know what it is. *Psychonomic Bulletin & Review*, 15(1), 28-25.
- Mack, M.L.**, Wong, A.C.-N., Gauthier, I., Tanaka, J., & Palmeri, T.J. (2007). Unraveling the time course of perceptual categorization: Does fastest mean first? In D. S. McNamara & J. G. Trafton (Eds.), *Proceedings of the 29th Annual Cognitive Science Society* (pp. 1253-1258). Austin, TX: Cognitive Science Society.
- Henderson, J.M., Brockmole, J.R., Castelano, M.S., & **Mack, M.L.** (2007). Visual saliency does not account for eye movements during visual search in real-world scenes. In Van Gompel, R.P.G., Fischer, M.H., Murray, W.S., & Hill, R.L. (Eds.), *Eye movements: A window on mind and brain*. Oxford: Elsevier.
- Richler, J.J., **Mack, M.L.**, Gauthier, I., & Palmeri, T.J. (2007). Distinguishing between perceptual and decisional sources of holism in face processing. In D. S. McNamara & J. G. Trafton (Eds.), *Proceedings of the 29th Annual Cognitive Science Society* (pp. 1427-1432). Austin, TX: Cognitive Science Society.
- Gajewski, D.A., Pearson, A.M., **Mack, M.L.**, Bartlett, F.N., & Henderson, J.M. (2005). Human Gaze Control in Real World Search. In Paletta, L.; Tsotsos, J.K.; Rome, E.; Humphreys, G. (Eds.), *Attention and Performance in Computational Vision* (pp. 83-99). New York: Springer-Verlag.
- Oliva, A., **Mack, M. L.**, Shrestha, M., & Peeper, A. (2004). Identifying the perceptual dimensions of visual complexity of scenes. In K. Forbus, D. Gentner, & T. Regier (Eds.), *Proceedings of the 26th Annual Cognitive Science Society* (pp. 1041-1046). Austin, TX: Cognitive Science Society.

Conference Presentations

- Mack, M.L. (March 2018). The dynamic formation of hippocampal concept representations during human category learning. *Talk presented at the COSYNE Annual Workshop*, Breckenridge, CO.
- Mack, M.L., Preston, A.R., Love, B.C. (November 2017). Medial prefrontal cortex compresses concept representations through learning. *Poster presented at the Society for Neuroscience Annual Meeting*, Washington, DC.
- Mack, M.L., Preston, A.R., Love, B.C. (November 2017). Medial prefrontal cortex compresses concept representations through learning. *Poster presented at the Annual Meeting of the Psychonomic Society*, Vancouver, BC.
- Chow, J.K., Mack, M.L. (November 2017). Object substitution masking reveals a competitive dynamic between levels of categorization. *Poster presented at the Annual Object Perception, Attention, and Memory Meeting*, Vancouver, BC.
- Mack, M.L., Preston, A.R., & Love, B.C. (2017). Medial prefrontal cortex compresses concept representations through learning. *Talk presented at the International Workshop on Pattern Recognition in Neuroimaging*, Toronto, ON.
- Mack, M.L., Preston, A.R., Love, B.C. (November 2016). Critical moments of learning are mediated by distinct hippocampal and frontoparietal encoding processes. *Poster presented at the Society for Neuroscience Annual Meeting*, San Diego, CA.

- Mack, M.L., Love, B.C., Preston, A.R. (May 2016). Attention shapes hippocampal representations during learning through interactions with frontoparietal cortex. *Talk presented at Context and Episodic Memory Symposium*, Philadelphia, PA.
- Mack, M.L., Preston, A.R., Love, B.C. (October 2015). The dynamics of hippocampal and prefrontal neural representations track the evolution of attentional biases during learning. *Talk presented at Society for Neuroscience Annual Meeting*, Chicago, IL.
- Molitor, R.J., Schlichting, M.L., Mack, M.L., Guarino, K.F., McKenzie, S., Eichenbaum, H., Preston, A.R. (October 2015). Schema representations in hippocampus and medial prefrontal cortex support generalization in novel contexts. *Poster presented at Society for Neuroscience Annual Meeting*, Chicago, IL.
- Mack, M.L., Love, B.C., & Preston, A.R. (May 2015). Linking learning models to the dynamics of neural representations. *Invited talk presented at the 30th Meeting of the Perceptual Expertise Network*, St. Pete Beach, Florida.
- Mack, M.L., Love, B.C., & Preston, A.R. (May 2015). The evolution of category knowledge: Linking learning models to the dynamics of neural representations. *Poster presented at Context and Episodic Memory Symposium*, Philadelphia, Pennsylvania.
- Mack, M.L., Love, B.C., & Preston, A.R. (April 2015). The evolution of category knowledge: Linking learning models to the dynamics of neural representations. *Poster presented at the Austin Conference for Learning and Memory*, Austin, Texas.
- Martinez, J.E., Mack, M.L., & Preston, A.R. (February 2015). The Company We Keep: Memory-driven Biases in Economic Decision Making. *Poster presented at the Annual Meeting of the Society for Personality and Social Psychology*.
- Mack, M.L., & Preston, A.R. (November 2014). Episodic reinstatement affects hippocampal and fronto-parietal comparator signals during mnemonic decision making. *Talk presented at Society for Neuroscience Annual Meeting*, San Diego, California.
- Mack, M.L., & Preston, A.R. (May 2014). The role of episodic reinstatement in mnemonic decision making. *Talk presented at Context and Episodic Memory Symposium*, Philadelphia, Pennsylvania.
- Mack, M.L., Preston, A.R., Love, B.C. (November 2013). Model-based multivariate fMRI reveals influence of selective attention on neural representations of categories. *Poster presented at Society for Neuroscience Annual Meeting*, San Diego, California.
- Mack, M.L., Preston, A.R., Love, B.C. (November 2013). Model-based fMRI reveals influence of attention on neural representations of categories. *Poster presented at the Annual Meeting of the Psychonomic Society*, Toronto, Ontario.
- Mack, M.L., Preston, A.R., Love, B.C. (October 2012). Model selection using multivariate measures of brain response: Exemplar vs. prototype theories of categorization. *Talk presented at Society for Neuroscience Annual Meeting*, New Orleans, Louisiana.

- Mack, M.L. & Palmeri, T.J. (May 2012). Uncovering the time course of categorization with object substitution masking. *Poster presented at the Twelfth Annual Meeting of Vision Sciences Society*, Naples, Florida.
- Mack, M.L. & Palmeri, T.J. (May 2011). Ultra-rapid categorization unraveled. *Poster presented at the Eleventh Annual Meeting of Vision Sciences Society*, Naples, Florida.
- Mack, M.L., Richler, J.J., Polyn, S., & Palmeri, T.J. (November 2010). Modeling effects of object naming on long-term object recognition memory. *Talk presented at the Eighteenth Annual Object, Perception, Attention, and Memory Conference*, St. Louis, Missouri.
- Mack, M.L. & Palmeri, T.J. (May 2010). The speed of categorization: A priority for people? *Poster presented at the Tenth Annual Meeting of Vision Sciences Society*, Naples, Florida.
- Mack, M.L. & Palmeri, T.J. (November 2009). Are detection and categorization tightly coupled? *Poster presented at the Fiftieth Annual Meeting of the Psychonomic Society*, Boston, Massachusetts.
- Mack, M.L. & Palmeri, T.J. (November 2008). Objects in Scenes: Is One System Enough? *Talk presented at the Sixteenth Annual Object, Perception, Attention, and Memory Conference*, Chicago, Illinois.
- Richler, J.J., Mack, M.L., Gauthier, I., & Palmeri, T.J. (November 2008). Holistic Processing of Faces is Fast. *Poster presented at the Sixteenth Annual Object, Perception, Attention, and Memory Conference*, Chicago, Illinois.
- Mack, M.L. & Palmeri, T.J. (May 2008). Dissociating Detection and Categorization. *Poster presented at the Eighth Annual Meeting of Vision Sciences Society*, Naples, Florida.
- Mack, M.L., Richler, J.J., Gauthier, I., & Palmeri, T.J. (May 2007). Comparing the locus of holistic processing in people and models. *Poster presented at the Seventh Annual Meeting of Vision Sciences Society*, Sarasota, Florida.
- Mack, M.L., Wong, A.C.-N., Gauthier, I., & Palmeri, T.J. (May 2006). The Time Course of Visual Object Detection and Categorization. *Poster presented at the Sixth Annual Meeting of Vision Sciences Society*, Sarasota, Florida.
- Mack, M.L. & Oliva, A. (November 2004). Computational Estimation of Visual Complexity. *Poster presented at the Twelfth Annual Object, Perception, Attention, and Memory Conference*, Minneapolis, Minnesota.
- Carlisle, N.B., Mack, M.L., & Oliva, A. (November 2004). The Role of Visual Complexity in Short Term Memory. *Poster presented at the Twelfth Annual Object, Perception, Attention, and Memory Conference*, Minneapolis, Minnesota.
- Castelhano, M.S., Mack, M.L., & Henderson, J.M. (November 2004). Task Influences on Eye Movement Control in Scenes. *Poster presented at the Forty-Fifth Annual Meeting of the Psychonomic Society*, Minneapolis, Minnesota.
- Brockmole, J.R., Mack, M.L., Castelhana, M.S., Oliva, A., & Henderson, J.M. (November 2004). Fixation Duration is Related to Local Image Statistics During

Real-World Scene Viewing. *Poster presented at the Forty-Fifth Annual Meeting of the Psychonomic Society*, Minneapolis, Minnesota.

Mack, M.L. & Oliva, A. (May 2004) The Perceptual Dimensions of Visual Simplicity. *Poster presented at the Fourth Annual Meeting of Vision Sciences Society*, Sarasota, Florida.

Mack, M.L., Oliva, A., Shrestha, M., & Peeper, A. (May 2004). The Representation of Complexity of Real-World Scenes. *Poster presented at the Fourth Annual Meeting of Vision Sciences Society*, Sarasota, Florida.

Mack, M.L., Castelhana, M.S., Henderson, J.M., & Oliva, A. (November 2003). What the Visual System "Sees": The relationship between fixation positions and image properties during a search task in real-world scenes. *Poster presented at the Eleventh Annual Object, Perception, Attention, and Memory Conference*, Vancouver, British Columbia.

Other Presentations

U of T Psychology ToNI Users Meeting Talk, Toronto, ON	2018
U of T Psychology Ebbinghaus Empire Talk, Toronto, ON	2017
UT Cognitive Neuroscience Brown Bag, Austin, Texas	2015
Young Scientists Spring Seminar Series, UT Neuroscience, Austin, Texas	2015
Food for Thought Talk Series, Center for Inquiry, Austin Chapter	2014
UT Center for Learning and Memory Annual Retreat, Austin, Texas	2012
UT Image Research Center Brown Bag, Austin, Texas	2012
22 nd Meeting of the Perceptual Expertise Network, Nashville, Tennessee	2011
21 st Meeting of the Perceptual Expertise Network, Chicago, Illinois	2010
19 th Meeting of the Perceptual Expertise Network, Pittsburgh, Pennsylvania	2009
Cognitive & Cognitive Neuroscience Seminar, Vanderbilt University	2009
17 th Meeting of the Perceptual Expertise Network, Chicago, Illinois	2008
16 th Meeting of the Perceptual Expertise Network, Banff, Alberta, Canada	2008
14 th Meeting of the Perceptual Expertise Network, New Haven, Connecticut	2007
Cognitive & Cognitive Neuroscience Seminar, Vanderbilt University	2007

Teaching Experience

University of Toronto, Toronto, ON	
Department of Psychology, <i>Sensation and Perception</i>	2018
Department of Psychology, <i>Human Neuroimaging Laboratory</i>	2017
Department of Psychology, <i>Computations of the Mind and Brain</i>	2017
The University of Texas at Austin, Austin, Texas	
Department of Statistics and Data Sciences Summer Statistics Institute, <i>Matlab</i>	2015
Department of Statistics and Data Sciences, <i>Matlab Short Course</i>	2014-2015
Vanderbilt University, Nashville, Tennessee	
Grader, <i>Introduction to Psychology</i> (Dr. Leslie Kirby)	2009
Teaching Assistant, <i>Principles of Experimental Design</i> (Dr. Thomas Palmeri)	2007
Teaching Assistant, <i>Principles of Experimental Design</i> (Dr. Adriane Seiffert)	2006

Professional Memberships & Affiliations

Psychonomic Society	2011-present
Association for Psychological Science	2012-present
Society for Neuroscience	2011-present
Vision Sciences Society	2004-2014
Cognitive Science Society	2007-2009
Perceptual Expertise Network, Vanderbilt University	2005-2011
Temporal Dynamics of Learning Center, UCSD	2007-2011

Ad-hoc Reviewer

Journals: Attention, Perception and Psychophysics; Cerebral Cortex; Cognition; Cognitive Science; Cortex; Current Biology; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Human Perception and Performance; Journal of Experimental Psychology: Learning, Memory, and Cognition; Journal of Mathematical Psychology; Journal of Neuroscience; Journal of Vision; Nature Communications; NeuroImage; Neuron; Neuropsychologia; PLoS:Biological; PLoS:ONE; Psychonomic Bulletin & Review; Quarterly Journal of Experimental Psychology; Visual Cognition; Vision Research

Grants/Fellowships: NSF Graduate Fellowship, Human Frontier Science Program, Netherlands Organisation for Scientific Research