

CONTACT INFORMATION	<p>190 Thayer St. Brown University, CLPS Providence, RI 02912</p> <p>anne_collins@brown.edu (401) 330-9931</p>
EDUCATION	<p>École Normale Supérieure, Paris, France 2006 – 2010 Université Pierre et Marie Curie, Paris, France <i>PhD candidate, Computational and cognitive neuroscience</i> Advisor: Dr. E. Koechlin, Laboratoire de neurosciences cognitives, INSERM U742.</p> <p>Behavioral experiments with healthy adult subjects in areas of reinforcement learning and cognitive control. Computational modeling (reinforcement learning, Bayesian inference).</p> <p>Federation of European Neuroscience, Arcachon, France August 2007 <i>Computational neuroscience summer school</i></p> <p>ENS, EHESS, Paris, France 2005 – 2006 <i>Master's degree in Cognitive Science</i> Advisor: Dr. E. Koechlin</p> <p>Ecole Polytechnique, Palaiseau, France 2002-2006 <i>Engineering diploma. Equivalent to a Master's in engineering.</i> 2006 <i>Bachelors of science, major in theoretical mathematics.</i> 2005</p> <p>Research rotation (one semester) in algebraic topology at the Centre de Mathématiques Laurent Schwartz, supervision Dr H. Abbaspour.</p>
PROFESSIONAL ACTIVITIES	<p>Post-doctoral research associate 2010-present Laboratory for Neural Computation and Cognition, Brown University, RI. Advisor: Dr M.J. Frank.</p> <p><i>Computational modeling</i> (Bayesian inference, reinforcement learning, neural network models) in the domains of learning and cognitive control. <i>Development and implementation</i> of computerized experimental paradigms for probing model mechanisms in reinforcement learning, cognitive control and structured learning. <i>Electro-encephalography</i> experiments and data analysis, including machine learning methods for decoding latent brain states. <i>Genetic and patient studies</i> probing relevant variants impacting above processes.</p> <p>Project coordinator 2013-2014 Coordination of a neural decoding competition as part of the new initiative for computation in brain and mind at Brown.</p> <p>Consultant 2013-2014 Consulting for Roche. Experimental design, data analysis and computational modeling for drug effect testing.</p>

PUBLICATIONS	Eight-Month-Old Infants Spontaneously Learn and Generalize Hierarchical Rules.	
	Werchan, DM; Collins, AGE; Frank, MJ; Amso, D. <i>Psychological Science</i> . 2015	
	Working memory contributions to reinforcement learning impairments in Schizophrenia. Collins, AGE; Brown, J; Gold, J; Waltz, J; Frank, MJ. <i>Journal of Neuroscience</i> . 2014	
	A Reinforcement Learning Mechanism Responsible for the Valuation of Free Choice. Cockburn, J, Collins, AGE, Frank, MJ. <i>Neuron</i> . 2014.	
	Human EEG uncovers latent generalizable rule structure during learning. Collins, AGE, Cavanagh, JF, Frank, MJ. <i>Journal of Neuroscience</i> . 2014.	
	Opponent Actor Learning (OpAL): Modeling interactive effect of striatal dopamine on reinforcement learning and choice incentive. Collins, AGE, Frank, MJ. <i>Psychological Review</i> . 2014.	
	Foundations of human reasoning in the prefrontal cortex. Donoso, M, Collins, AGE, Koechlin, E; <i>Science</i> , 2014	
	Cognitive control over learning: Creating, clustering and Generalizing task-set structure. Collins, AGE, Frank, MJ. <i>Psychological Review</i> . 2013.	
	Negative Symptoms and the Failure to Represent the Expected Reward Value of Actions: Behavioral and Computational Modeling Evidence. Gold JM; Waltz JA; Matveeva TM, Kasanova, Z; Strauss, GP; Herbener, EH; Collins, AGE; Frank, MJ. <i>Arch Gen Psychiatry</i> . 2012.	
	Reasoning, Learning and Creativity: Frontal lobe functions and human decision-making. Collins, AGE, Koechlin, E; <i>PLoS Biology</i> , 2012	
SUBMITTED PAPERS	How much of reinforcement Learning is working Memory, not reinforcement Learning? Collins, AGE, Frank, MJ; <i>European Journal of Neuroscience</i> , 2012.	
	A computational theory of prefrontal executive function. Collins, AGE, Koechlin, E; <i>Proceedings of the 2009 COSYNE conference, Frontiers in Neuroscience</i> , 2009.	
TEACHING	Neural signature of latent structure learning predicts hierarchical clustering and transfer of rule sets. Collins, AGE; Frank, MJ.	
	Motor demands constrain cognitive rule structures. Collins, AGE; Frank, MJ.	
INVITED PRESENTATIONS	Teaching assistant .	2006 – 2009
	Universite Pierre et Marie Curie, Paris, France. 192 hours teaching mathematics for undergraduate biology students (statistics, linear algebra, dynamical systems).	
	Guest lecturer.	2009 – 2010
	Master in Cognitive Science, École Normale Supérieure, Paris. Computational models for cognitive control.	
	Constraints and priors in human structure learning.	2015/10
	Society for Neuroscience, Chicago, IL	
	Disentangling multiple contributions to human learning.	2015/10
	Harvard McLean Hospital, Belmont, MA.	

Working memory contribution to learning impairments in schizophrenia. 2015/09
ECSR conference, Berlin.

Creating structure and generalizing in learning. 2015/05
ESCONS conference, San Francisco.

The hidden players in reinforcement learning. 2015/01-02
Lyon; Boston University; Stanford; University of Michigan; Columbia; Berkeley.

Prefrontal contributions to reinforcement learning. 2014/09
NYU, NY.

Computational models of structure learning in humans. 2014/07
Neuromorphic workshop, Telluride, CO.

Generalization and transfer in structure learning. 2014/05
Symposium for the Biology of Decision Making, Paris, France.

Explorations of structure learning 2014/02
Princeton, NJ.

Many actors in reinforcement learning 2014/02
Rochester, NY.

Many actors in reinforcement learning 2014/01
Irvine, CA.

Creating and generalizing task-set structure in corticostriatal circuits. 2013/03
COSYNE workshops.

Two levels of rule generalization in reinforcement learning with latent structure. 2012/12
MBI computational neuroscience workshop, Columbus (OH).

Structured learning and task-set transfer during reinforcement learning. 2012/05
Princeton, NJ.

Learning and cognitive control: neurobiologically explicit models for inferring hidden structure. 2012/01
ICARUS workshop, Boston.

Working memory contributions to reinforcement learning. 2012/01
LNC, ENS, Paris.

Learning hidden structure for cognitive control. 2011/07
Mathematical Psychology annual meeting.

Invited student Gatsby, UCL, London (UK). 2009/06

POSTERS

Working memory contributions to reinforcement learning: an fMRI study.
Collins, AGE; Ciullo, B; Frank, MJ; Badre, D. *SfN*, Chicago, 2015.

Antipsychotic medications induce sustained alterations in approach/avoidance learning. Vierling-Claassen, NE; Collins, AGE; Burke, D; Warwick, H; Rego, B; Hill, M; Bath, K; Frank, MJ; Moore, CI. *SfN*, Chicago, 2015.

Feature-based attention during sequential tasks. Desrochers, TM; Collins, AGE; Badre, D. *SfN*, Chicago, 2015.

Interaction between reinforcement learning and Working memory. Collins, AGE; Frank, MJ. *SBDM*, Paris, 2015.

Prefrontal cortex and uncertainty during sequential tasks. Desrochers, TM; Collins, AGE; Badre, D. *CNS*, San Francisco, 2015.

Neural signature of latent structure during learning predicts hierarchical clustering and transfer of rule sets. Collins, AGE; Frank, MJ. *CNS*, San Francisco, 2015.

Working memory contributions to reinforcement learning impairments in schizophrenia. Collins, AGE; Gold, J; Waltz, J; Frank, MJ. *COSYNE*, Salt Lake City, 2014.

Why do we structure knowledge? Two levels of rule generalization in reinforcement learning. Collins, AGE, Frank, MJ. *SfN*, 2013.

Motor patterns impose priors on abstract rule structure representations. Collins, AGE, Frank, MJ. *RLDM*, Princeton, NJ, october, 2013.

Interactive effects of learning and choice incentive in the striatal dopamine system: Computational model. Collins, AGE, Frank, MJ. *COSYNE*, Salt Lake City, 2013.

EEG predictors of structured learning and task-set transfer during reinforcement learning. Collins, AGE, Cavanagh, JF, Frank, MJ. *SfN*, New Orleans, 2012.

Why (and how much) do we value the freedom to choose? Decision enhances spatial credit assignment in reinforcement learning. Cockburn, J, Collins, AGE, Frank, MJ. *SfN*, New Orleans, 2012.

Welcome to the machine: Pattern classifiers reveal latent cognitive states. Cavanagh, JF, Collins, AGE, Frank, MJ. *SPR*, 2012.

Incidental structured learning and abstraction in cognitive reinforcement learning. Collins, AGE, Frank, MJ. *COSYNE*, Salt Lake City, 2012.

Working memory contributions to reinforcement learning: Computational and genetic analysis. Collins, AGE, Frank, MJ. *SfN*, 2011.

A bias to apply hierarchical structure in learning: a computational and behavioral study. Collins, AGE, Frank, MJ. *CNS*, 2011.

A computational theory of prefrontal executive function. Collins, AGE, Koechlin, E. *COSYNE*, 2009.

GRANTS AND
FELLOWSHIPS

How prefrontal cortex augments reinforcement learning.	2015-2018
NSF CompCog award 1460604 to Michael J Frank and Anne GE Collins.	
Allocation Monitorat Polytechnicien (AMX).	2006 – 2009
Graduate studies and teaching assistant grant.	
Undergraduate studies full grant.	2002– 2006
Indemnité d'élève officier polytechnicien.	

SKILLS

Computer skills

Advanced: Matlab (including statistics toolbox and psychtoolbox), SPSS, LaTeX.

Intermediate: Python, R, Linux. Basic: java.

Languages

French(native), English (fluent), German (fluent), Japanese (intermediate), Russian (intermediate).

HOBBIES

Music Proficient cello player, classical singer. Chamber music, choir.

Outdoors Hiking, biking, swimming, sailing.