

Education

- 2009 **University of Pittsburgh**
Ph.D. in Neuroscience and affiliated with the Center for the Neural Basis of Cognition and Carnegie Mellon University
PhD Advisor: Walter Schneider (Psychology and neuroscience)
- 2003 **University of California, Berkeley**
B.A. in Cognitive Science (Highest Honors)

Research and Work Experience

- 2014 – *Present* Assistant professor at the Center for Molecular & Behavioral Neuroscience (CMBN), Rutgers University-Newark. Director of the Cole Neurocognition Laboratory
- 2012 – 2013 Post-doctoral research with Steven Petersen (Neuroscience, Radiology, Psychology, Washington University in St. Louis)
Investigations of brain network organization and cognitive control
Methods: fMRI, functional connectivity, graph theory
- 2009 – 2013 Post-doctoral research with Todd Braver & Deanna Barch (Department of Psychology, Washington University in St. Louis)
Investigations of prefrontal cortex, cognitive control, learning, schizophrenia, & intelligence
Methods: fMRI, machine learning, functional connectivity, individual differences
- 2004 – 2009 Ph.D. research with Walter Schneider (Department of Psychology, University of Pittsburgh)
Investigations of prefrontal cortex, cognitive control, & learning/memory
Methods: fMRI, MEG, EEG, functional connectivity, computational modeling
- 2001 – 2004 Undergraduate and post-baccalaureate research with Mark D'Esposito (UC Berkeley)
Investigations of prefrontal cortex and cognitive control
Methods: fMRI, GLM analysis, event-related time series analysis
- 2003 Undergraduate research with William DeBello (UC Davis)
Investigations of the genetic basis of learning and memory
Methods: PCR, analysis of gene expression, gene sequence identification
- 2001 – 2003 Software engineering and web development for Apple, Inc.

Honors and Awards

- 2015 – *Present* Elected to be member of the Cognitive Neuroscience Society's Symposium Committee
- 2012 Faculty of 1000, Associate Faculty Member
- 2011 Fellow at the Summer Institute in Cognitive Neuroscience, Santa Barbara, CA
- 2010 NeuroImage Editor's Choice Award
For Cole et al. 2010, "Identifying the brain's most globally connected regions"
Awarded by the editors in acknowledgment of a study's importance and high impact
- 2005 – 2008 National Science Foundation Graduate Research Fellowship
Awarded to graduate students whose plans for research have "intellectual merit and beneficial implications for society"
- 2007 National Science Foundation Integrative Graduate Education and Research Traineeship (IGERT) Fellowship

Awarded to science graduate students “who will pursue careers in research and education, with the interdisciplinary backgrounds, deep knowledge in chosen disciplines, and technical, professional, and personal skills to become leaders and creative agents for change.”

2003 Highest Honors in Cognitive Science at UC Berkeley
Awarded highest honors based on significant contribution to a research project and high quality honors thesis as judged by professors Mark D’Esposito, M.D. and Robert Knight, M.D.

Organizational Leadership and Professional Memberships

2016 – Present Founder and organizer (along with Drew Headley) of the Integrative Neuroscience Discussion Group (INDG) at the Center for Molecular & Behavioral Neuroscience. This is a group that seeks to develop unified understandings between human and non-human (animal and computational models) neuroscience and psychology.

2015 – Present Member and co-organizer of Newark Brain Connectivity meetings. These meetings bring together scientists interested in brain connectivity research from Newark, NJ and the surrounding region (such as neuroscientists and psychologists from Rutgers University and New Jersey Institute of Technology).

2004 – Present Society for Neuroscience
Cognitive Neuroscience Society

2010 – Present Psychonomic Society

2009 – Present Neuroethics Society

2006 – Present Organization for Human Brain Mapping

2004 – 2009 Center for the Neural Basis of Cognition, Carnegie Mellon & University of Pittsburgh
Center for Neuroscience, University of Pittsburgh
Learning Research and Development Center

2006 – 2007 President of the Department of Neuroscience Graduate Student Organization, University of Pittsburgh

2002 – 2003 President of the Cognitive Science Student Association, UC Berkeley

Research Grants and Fellowships

National Science Foundation BCS 1756065 (PI: Tricomi, E., Co-I: Cole, M.W.) 2018-2020
Social, Behavioral, and Economic Sciences directorate
Title: Imaging the effects of psychosocial stress on cognitive performance
Total costs: \$408,699
Project Role: Co-Investigator

National Institutes of Health – National Institute on Aging (R01 AG055556) 2017-2022
Brain Network Mechanisms of Aging-Related Cognitive Decline
PI: Michael W. Cole
Total direct costs: \$250,000/year
The goal of this research is to identify network mechanisms that can account for the alterations in both intrinsic brain connectivity and cognitive task activations that occur with aging-related decline (from ages 18-28 to 65-75) of cognitive control abilities among healthy older adults.

National Institutes of Health – National Institute of Mental Health (R01 MH109520) 2016-2021

Brain Network Mechanisms of Instructed Learning

PI: Michael W. Cole

Total direct costs: \$250,000/year

The goal of this research is to utilize the tools of network neuroscience to improve understanding of how instructed learning is implemented in the human brain, from initial learning to expertise.

National Institutes of Health – National Institute of Mental Health (K99-R00 MH096801) 2012-2017

Network Mechanisms of Flexible Cognitive Control

PI: Michael W. Cole

Total direct costs: \$157,000/year

This project investigates the hypothesis that flexible cognition and behavior is supported by flexible hubs – frontoparietal brain regions with extensive global brain connectivity that flexibly updates according to task demands.

National Science Foundation (IGERT Fellowship) 2007

Beyond Localization of Memory Functions: Learning Statistical Methods for Estimating Directed Connectivity among Cortical Regions Using Multiple Neuroimaging Technologies

PI: Michael W. Cole

Funded amount: \$30,000

The goal of this research is to learn methodological techniques for estimating directed functional (effective) connectivity and empirically test the efficacy of those techniques using functional MRI and magnetoencephalography.

National Science Foundation (Graduate Research Fellowship) 2005-2008

Dissociating the Network Components Underlying Cognitive Control

PI: Michael W. Cole

Funded amount: \$90,000

The goal of this project is to utilize experimental manipulations of cognitive control processes with functional MRI to identify the shared and specialized roles of cognitive control network brain regions.

Preprint Scientific Publications

1. Chen RH, Ito T, Kulkarni KR, **Cole MW** (Preprint). Large-scale multivariate activation states of the human brain, bioRxiv. <http://doi.org/10.1101/068221>
2. Schultz DH, Ito T, Kulkarni KR, Mill RD, Chen RH, Solomyak LI, **Cole MW** (Preprint). Global connectivity of the frontoparietal cognitive control network is related to depression symptoms in undiagnosed individuals. bioRxiv. <https://doi.org/10.1101/185306>
3. Spronk M, Ji JL, Kulkarni K, Repovs G, Anticevic A, **Cole MW** (Preprint) “Mapping the human brain's cortical-subcortical functional network organization”. *bioRxiv*. <http://doi.org/10.1101/206292>

Peer-reviewed Scientific Publications

Google Scholar profile: <https://scholar.google.com/citations?user=8FK99kkAAAAJ&hl=en>

PubMed/NCBI Bibliography:

<http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/43569594/?sort=date&direction=descending>

h-index (as of 2018-01-27): 30

Citations (as of 2018-01-27): 4243

1. Dixon ML, De La Vega A, Mills C, Andrews-Hanna J, Spreng RN, **Cole MW**, Christoff K (In Press) "Heterogeneity Within the Frontoparietal Control Network and its Relationship to the Default and Dorsal Attention Networks". *Proceedings of the National Academy of Sciences*.
2. Ito T, Kulkarni KR, Schultz DH, Mill RD, Chen RH, Solomyak LI, **Cole MW** (2017) "Cognitive task information is transferred between brain regions via resting-state network topology". *Nature Communications*. 8:1027. PMID: PMC5715061 <http://doi.org/10.1038/s41467-017-01000-w>
3. Li Q, Yang G, Li Z, Qi Y, **Cole MW**, Liu X (2017) "Conflict detection and resolution rely on a combination of common and distinct cognitive control networks.". *Neuroscience and Biobehavioral Reviews*. 83:123–131. PMID: 29017916 <http://doi.org/10.1016/j.neubiorev.2017.09.032>
4. **Cole MW**, Patrick L, Meiran N, Braver T (In Press) "A role for proactive control in rapid instructed task learning". *Acta Psychologica*. <https://doi.org/10.1016/j.actpsy.2017.06.004>
5. **Cole MW**, Braver TS, Meiran N (2017) "The task novelty paradox: Flexible control of inflexible neural pathways during rapid instructed task learning.". *Neuroscience and Biobehavioral Reviews*. 81:4–15. PMID: PMC5705534 <http://doi.org/10.1016/j.neubiorev.2017.02.009>
6. Mill RD, Ito T, **Cole MW** (2017) "From connectome to cognition: The search for mechanism in human functional brain networks.". *NeuroImage*. 160:124–139. PMID: PMC5529276 <http://doi.org/10.1016/j.neuroimage.2017.01.060>
7. Mill RD, Bagic A, Bostan A, Schneider W, **Cole MW** (2017) "Empirical validation of directed functional connectivity". *NeuroImage*. 146:275–287. PMID: 27856312 <http://dx.doi.org/10.1016/j.neuroimage.2016.11.037>
8. **Cole MW**, Ito T, Bassett DS, Schultz DH (2016) "Activity flow over resting-state networks shapes cognitive task activations". *Nature Neuroscience*. 19(12):1718–26. PMID: 27723746 <http://dx.doi.org/10.1038/nn.4406>
9. Schultz DH, **Cole MW** (2016) "Integrated Brain Network Architecture Supports Cognitive Task Performance". *Neuron*. 92:278–279. <http://doi.org/10.1016/j.neuron.2016.10.004>
10. Schultz DH, **Cole MW** (2016) "Higher intelligence is associated with less task-related brain network reconfiguration". *Journal of Neuroscience*. 36(33):8551– 8561. <http://doi.org/10.1523/JNEUROSCI.0358-16.2016>
11. **Cole MW**, Yang GJ, Murray JD, Repovs G, Anticevic A (2016) "Functional connectivity change as shared signal dynamics". *Journal of Neuroscience Methods*. 259:22–39. PMID: PMC4715953 <http://doi.org/10.1016/j.jneumeth.2015.11.011>
12. **Cole MW**, Ito T, Braver TS (2016) "The Behavioral Relevance of Task Information in Human Prefrontal Cortex.". *Cerebral Cortex*. 26:2497–2505. PMID: PMC4869805 <http://doi.org/10.1093/cercor/bhv072>

13. Etzel JA, **Cole MW**, Zacks JM, Kay KN, Braver TS (2016) "Reward Motivation Enhances Task Coding in Frontoparietal Cortex.". *Cerebral Cortex*. 26:1647–1659. PMID: PMC4785950 <http://doi.org/10.1093/cercor/bhu327>
14. Mattar MG, **Cole MW**, Thompson-Schill SL, Bassett DS (2015) "A Functional Cartography of Cognitive Systems.". *PLoS Computational Biology*. 11:e1004533. PMID: PMC4668064 <http://doi.org/10.1371/journal.pcbi.1004533>
15. **Cole MW**, Ito T, Braver TS (2015) "Lateral Prefrontal Cortex Contributes to Fluid Intelligence Through Multinetwork Connectivity.". *Brain Connectivity*. 5:497–504. PMID: PMC4601676 <http://doi.org/10.1089/brain.2015.0357>
16. Anticevic A, Hu X, Xiao Y, Hu J, Li F, Bi F, **Cole MW**, Savic A, Yang GJ, Repovs G, Murray JD, Wang X-J, Huang X, Lui S, Krystal JH, Gong Q (2015) "Early-course unmedicated schizophrenia patients exhibit elevated prefrontal connectivity associated with longitudinal change.". *Journal of Neuroscience*. 35:267–286. PMID: PMC4287147 <http://doi.org/10.1523/JNEUROSCI.2310-14.2015>
17. Meiran N, Pereg M, Kessler Y, **Cole MW**, Braver TS (2015) "Reflexive activation of newly instructed stimulus-response rules: evidence from lateralized readiness potentials in no-go trials.". *Cogn Affect Behav Neurosci*. 15:365–373. PMID: 25216992 <http://doi.org/10.3758/s13415-014-0321-8>
18. Meiran N, Pereg M, Kessler Y, **Cole MW**, Braver TS (2015) "The power of instructions: Proactive configuration of stimulus-response translation.". *Journal of Experimental Psychology: Learning, Memory, and Cognition*. 41:768–786. PMID: 25329082 <http://doi.org/10.1037/xlm0000063>
19. **Cole MW**, Bassett DS, Power JD, Braver TS, Petersen SE (2014) "Intrinsic and task-evoked network architectures of the human brain.". *Neuron*. 83:238–251. PMID: PMC4082806 <http://doi.org/10.1016/j.neuron.2014.05.014>
20. **Cole MW**, Repovs G, Anticevic A (2014) "The frontoparietal control system: a central role in mental health.". *The Neuroscientist*. 20:652–664. PMID: PMC4162869 <http://doi.org/10.1177/1073858414525995>
21. Yang GJ, Murray JD, Repovs G, **Cole MW**, Savic A, Glasser MF, Pittenger C, Krystal JH, Wang X-J, Pearlson GD, Glahn DC, Anticevic A (2014) "Altered global brain signal in schizophrenia.". *Proceedings of the National Academy of Sciences*. 111:7438–7443. PMID: PMC4034208 <http://doi.org/10.1073/pnas.1405289111>
22. Anticevic A, Hu S, Zhang S, Savic A, Billingslea E, Wasyluk S, Repovs G, **Cole MW**, Bednarski S, Krystal JH, Bloch MH, Li C-SR, Pittenger C (2014) "Global resting-state functional magnetic resonance imaging analysis identifies frontal cortex, striatal, and cerebellar dysconnectivity in obsessive-compulsive disorder.". *Biol Psychiatry*. 75:595–605. PMID: PMC3969771 <http://doi.org/10.1016/j.biopsych.2013.10.021>
23. Anticevic A, Tang Y, Cho YT, Repovs G, **Cole MW**, Savic A, Wang F, Krystal JH, Xu K (2014) "Amygdala connectivity differs among chronic, early course, and individuals at risk for

developing schizophrenia.”. *Schizophr Bull.* 40:1105–1116. PMID: PMC4133672
<http://doi.org/10.1093/schbul/sbt165>

24. Anticevic A, **Cole MW**, Repovs G, Murray JD, Brumbaugh MS, Winkler AM, Savic A, Krystal JH, Pearlson GD, Glahn DC (2014) “Characterizing thalamo-cortical disturbances in schizophrenia and bipolar illness.”. *Cerebral Cortex.* 24:3116–3130. PMID: PMC4224238
<http://doi.org/10.1093/cercor/bht165>
25. **Cole MW**, Reynolds JR, Power JD, Repovs G, Anticevic A, Braver TS (2013) “Multi-task connectivity reveals flexible hubs for adaptive task control.”. *Nat Neurosci.* 16:1348–1355. PMID: PMC3758404 <http://doi.org/10.1038/nn.3470>
26. Anticevic A, **Cole MW**, Repovs G, Savic A, Driesen NR, Yang G, Cho YT, Murray JD, Glahn DC, Wang X-J, Krystal JH (2013) “Connectivity, pharmacology, and computation: toward a mechanistic understanding of neural system dysfunction in schizophrenia.”. *Front Psychiatry.* 4:169. PMID: PMC3871997 <http://doi.org/10.3389/fpsy.2013.00169>
27. Anticevic A, Brumbaugh MS, Winkler AM, Lombardo LE, Barrett J, Corlett PR, Kober H, Gruber J, Repovs G, **Cole MW**, Krystal JH, Pearlson GD, Glahn DC (2013) “Global prefrontal and fronto-amygdala dysconnectivity in bipolar I disorder with psychosis history.”. *Biol Psychiatry.* 73:565–573. PMID: PMC3549314 <http://doi.org/10.1016/j.biopsych.2012.07.031>
28. **Cole MW**, Laurent P, Stocco A (2013) “Rapid instructed task learning: a new window into the human brain's unique capacity for flexible cognitive control.”. *Cogn Affect Behav Neurosci.* 13:1–22. PMID: PMC3557598 <http://doi.org/10.3758/s13415-012-0125-7>
29. Anticevic A, **Cole MW**, Murray JD, Corlett PR, Wang X-J, Krystal JH (2012) “The role of default network deactivation in cognition and disease.”. *Trends Cogn Sci (Regul Ed).* 16:584–592. PMID: PMC3501603 <http://doi.org/10.1016/j.tics.2012.10.008>
30. **Cole MW**, Yarkoni T, Repovs G, Anticevic A, Braver TS (2012) “Global connectivity of prefrontal cortex predicts cognitive control and intelligence.”. *Journal of Neuroscience.* 32:8988–8999. PMID: PMC3392686 <http://doi.org/10.1523/JNEUROSCI.0536-12.2012>
31. Meiran N, **Cole MW**, Braver TS (2012) “When planning results in loss of control: intention-based reflexivity and working-memory.”. *Front Hum Neurosci.* 6:104. PMID: PMC3347625
<http://doi.org/10.3389/fnhum.2012.00104>
32. **Cole MW**, Etzel JA, Zacks JM, Schneider W, Braver TS (2011) “Rapid transfer of abstract rules to novel contexts in human lateral prefrontal cortex.”. *Front Hum Neurosci.* 5:142. PMID: PMC3221399 <http://doi.org/10.3389/fnhum.2011.00142>
33. **Cole MW**, Anticevic A, Repovs G, Barch D (2011) “Variable global dysconnectivity and individual differences in schizophrenia.”. *Biol Psychiatry.* 70:43–50. PMID: PMC3204885
<http://doi.org/10.1016/j.biopsych.2011.02.010>
34. **Cole MW**, Bagic A, Kass R, Schneider W (2010) “Prefrontal dynamics underlying rapid instructed task learning reverse with practice.”. *Journal of Neuroscience.* 30:14245–14254. PMID: PMC3128837 <http://doi.org/10.1523/JNEUROSCI.1662-10.2010>

35. **Cole MW**, Yeung N, Freiwald WA, Botvinick M (2010) “Conflict over cingulate cortex: Between-species differences in cingulate may support enhanced cognitive flexibility in humans.”. *Brain Behav Evol.* 75:239–240. PMID: 20693782 <http://doi.org/10.1159/000313860>
36. Braver TS, **Cole MW**, Yarkoni T (2010) “Vive les differences! Individual variation in neural mechanisms of executive control.”. *Curr Opin Neurobiol.* 20:242–250. PMCID: PMC2904672 <http://doi.org/10.1016/j.conb.2010.03.002>
37. **Cole MW**, Pathak S, Schneider W (2010) “Identifying the brain's most globally connected regions.”. *NeuroImage.* 49:3132–3148. PMID: 19909818 <http://doi.org/10.1016/j.neuroimage.2009.11.001>
38. **Cole MW**, Yeung N, Freiwald WA, Botvinick M (2009) “Cingulate cortex: diverging data from humans and monkeys.”. *Trends Neurosci.* 32:566–574. PMID: 19781794 <http://doi.org/10.1016/j.tins.2009.07.001>
39. **Cole MW**, Schneider W (2007) “The cognitive control network: Integrated cortical regions with dissociable functions.”. *NeuroImage.* 37:343–360. PMID: 17553704 <http://doi.org/10.1016/j.neuroimage.2007.03.071>
40. Schumacher EH, **Cole MW**, D'Esposito M (2007) “Selection and maintenance of stimulus-response rules during preparation and performance of a spatial choice-reaction task.”. *Brain Research.* 1136:77–87. PMCID: PMC1892617 <http://doi.org/10.1016/j.brainres.2006.11.081>
41. Hester R, D'Esposito M, **Cole MW**, Garavan H (2007) “Neural mechanisms for response selection: comparing selection of responses and items from working memory.”. *NeuroImage.* 34:446–454. PMID: 17071112 <http://doi.org/10.1016/j.neuroimage.2006.08.001>
42. Curtis CE, **Cole MW**, Rao VY, D'Esposito M (2005) “Canceling planned action: an fMRI study of countermanding saccades.”. *Cereb Cortex.* 15:1281–1289. PMID: 15616130 <http://doi.org/10.1093/cercor/bhi011>

Book Chapters and Conference Proceedings Publications

1. **Cole M.W.** (2017). “Control and Connectivity: Dynamic Networks in the Human Brain”. Book chapter in: Egnor T. *Wiley Handbook of Cognitive Control*. John Wiley & Sons, Ltd.
2. Meiran N., **Cole M.W.**, and Braver T.S. (2013). “When Planning Results in Loss of Control: Intention-Based Reflexivity and Proactive Control”. Book chapter in: Seebass, G., Schmitz, M., & Gollwitzer, P. M. *Acting intentionally and its limits: Individuals, groups, institutions*. Berlin: De Gruyter.
3. Etzel, J.A., **Cole M.W.**, Braver T.S. (2012). “Looking Outside the Searchlight”. In G. Langs, I. Rish, M. Grosse-Wentrup, & B. Murphy (Eds.), *Machine Learning and Interpretation in Neuroimaging. Lecture Notes in Computer Science.* (vol. 7263, pp. 26–33). Springer Berlin / Heidelberg. doi:10.1007/978-3-642-34713-9_4

4. Schneider W., Pathak S., Phillips J.S., **Cole M.W.** (2009). “High Definition Fiber Tracking Exposes Circuit Diagram for Brain Showing Triarchic Representation, Domain General Control, and Metacognitive Subsystems”. *AAAI Fall Symposium: Biologically Inspired Cognitive Architectures*
5. Schneider W., **Cole M.W.**, Pathak S. (2008). “Reverse Engineering the Brain with a Circuit Diagram Based on a Segmented Connectome and System Dynamics”. *AAAI Fall Symposium: Biologically Inspired Cognitive Architectures*

Invited Talks and Symposia

1. **Cole M.W.** (April, 2018). The Cognitive and Computational Relevance of Functional Brain Networks. Invited CNBC Alumni Talk to be presented at the Center for the Neural Basis of Cognition (CNBC), University of Pittsburgh and Carnegie Mellon University, Pittsburgh, PA.
1. **Cole M.W.** (November, 2017). Neural and cognitive bases of rational and critical thinking. Invited talk presented at Columbia University, New York, NY.
2. **Cole M.W.** (March, 2017). The Cognitive Relevance of Functional Brain Networks. Invited talk presented at Carnegie Mellon University, Pittsburgh, PA.
3. **Cole M.W.** (February, 2017). Stable and Dynamic Functional Brain Network Architectures Underlying Flexible Cognition. Invited talk presented at Vanderbilt University, Nashville, TN.
4. **Cole M.W.** (November, 2016). Functional Brain Network Mechanisms Underlying Flexible Cognitive Control. Invited talk presented at the Control Processes Conference in San Diego, CA.
5. **Cole M.W.** (October, 2016). Stable and Dynamic Functional Brain Network Architectures Underlying Flexible Cognition. Invited talk presented at the Cognitive Neuroscience Seminar Series at Taub Institute, Columbia Medical School, New York, NY.
6. **Cole M.W.** (June, 2016). Brain network mechanisms of rapid instructed task learning. Invited talk presented at the Attention & Performance Conference, Turnhout, Belgium.
7. **Cole M.W.** (May, 2016). Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at Humbolt University, Berlin, Germany.
8. **Cole M.W.** (July, 2015). Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the Dresden Symposium on Volition and Cognitive Control, Dresden, Germany.
9. **Cole M.W.** (April, 2015). Flexible Learning: Understanding Cognitive Control and Intelligence in the Brain. Talk presented at Rutgers Research Day, Newark, NJ.
10. **Cole M.W.** (March, 2015). Human brain network dynamics and goal-directed cognition. Talk presented at Newark NeuroTalks, Newark, NJ.

11. **Cole M.W.** (November, 2014). Functional connectivity differences in brain networks: contributions of shared and unshared variance. Invited talk presented at the Asilomar conference, Pacific Grove, CA.
12. **Cole M.W.** (August, 2014). Multi-task functional connectivity and flexible hubs. Invited talk presented at the International Conference on Cognitive Neuroscience (ICON), Brisbane, Australia.
13. **Cole M.W.** (June 20, 2014). Intrinsic and dynamic brain network architectures underlying adaptive behavior in humans. Invited talk presented at the Princeton Neuroscience Institute, Princeton, NJ.
14. **Cole M.W.** (May 14, 2014). Intrinsic and task-evoked network architectures of the human brain. Invited talk presented at the Nathan S. Kline Institute (NKI), Orangeburg, NY.
15. **Cole M.W.** (May 10, 2014). Flexible Thinking: Understanding Cognitive Control and Intelligence in the Brain. Invited talk presented at the Learning and the Brain conference, New York, NY.
16. **Cole M.W.** (November 7, 2013). Intrinsic and Dynamic Network Architectures of the Human Brain. Invited talk presented at the Psychology Department, UC Berkeley, Berkeley, CA.
17. **Cole M.W.** (April 8, 2013). Brain Network Mechanisms of Flexible Cognitive Control in Health and Disease. Invited talk presented at the Department of Psychiatry, Yale, New Haven, CT.
18. **Cole M.W.** (January 15, 2013). Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the McGovern Institute for Brain Research, MIT, Cambridge, MA.
19. **Cole M.W.** (December 14, 2012). A role for the brain network mechanisms of flexible cognitive control in human intelligence. Invited talk presented at the International Society for Intelligence Research, San Antonio, TX.
20. **Cole M.W.** (November 9, 2012). Global Brain Connectivity and Other Graph Theoretical Approaches: Methods and Findings. Invited talk/workshop presented at the MRI Users' Meeting Group, The Ohio State University, Columbus, OH.
21. **Cole M.W.** (November 7, 2012). Brain Network Mechanisms of Flexible Cognitive Control. Invited talk presented at the Center for Molecular and Behavioral Neuroscience, Rutgers, Newark, NJ.
22. **Cole M.W.** (March 18, 2011). Investigating Global Brain Connectivity: Methods, Software, and Findings. Talk presented at the Neuroimaging Informatics and Analysis Center seminar series, Washington University, St. Louis, MO.
23. **Cole M.W.** (March 3, 2010). Multiple Network Mechanisms Underlying Flexibility in Prefrontal Cortex. Talk presented at the Brain, Behavior, and Cognition seminar series, Washington University, St. Louis, MO.

24. **Cole M.W.** (January 4, 2010). Network Mechanisms Underlying Flexibility in Prefrontal Cortex. Invited talk presented as part of the Center for Mind and Brain seminar series, UC Davis, Davis, CA.
25. **Cole M.W.** (May 13, 2008). Source Localization with MEG: An MNE Software Overview. Talk presented for the University of Pittsburgh MEG center, Pittsburgh, PA.
26. **Cole M.W.** (January 22, 2008). Connectomics of the Human Cognitive Control Network. Invited talk presented for Beatriz Luna's lab, Pittsburgh, PA.
27. **Cole M.W.** (October 28, 2006). Using Functional MRI to Inform Neural Models of Decision Making. Talk presented at the annual CNBC retreat, Pittsburgh, PA.
28. **Cole M.W.** (October 2, 2006). Specialization and integration within a cortical cognitive control network. Talk presented at the CNBC 'Brain Bag', Pittsburgh, PA.
29. **Cole M.W.** (March 27, 2006). Innate functional connectivity from resting state linear correlations. Invited talk presented at the Clinical Cognitive Neuroscience Lab's Methods Monday forum, Pittsburgh, PA.
30. **Cole M.W.** (November 2, 2005). Dissociations in Cognitive Control: The Specialized Roles of Lateral and Medial Prefrontal Cortex. Talk presented at the Cognitive Psychology 'Brown Bag', Pittsburgh, PA.
31. **Cole M.W.** (October 1, 2005). Results and statistics in fMRI. Talk presented at the 2005 CNBC fMRI Workshop, Pittsburgh, PA.

Published Abstracts and Presentations

1. Ito T. & **Cole M.W.** (November, 2017). Cognitive control networks contain a mixture of diverse connectivity patterns characteristic of predicted flexible hub mechanisms. Poster presented at the Society for Neuroscience, Washington, DC.
2. Schultz D., Ito T., Solomyak L., Chen R., Mill R., Kulkarni K., **Cole M.W.** (November, 2017). Systematic flexibility of global functional connectivity patterns supports flexible cognitive control. Poster presented at the Society for Neuroscience, Washington, DC.
3. **Cole M.W.** & Ito T. (September, 2017). Computational Network Mechanisms of Task-Evoked Functional Connectivity. Poster presented at Cognitive Computational Neuroscience, New York, NY.
4. **Cole M.W.**, Schultz D., Mill R. (June, 2017). Activity flows over intrinsic and task-evoked functional networks shape cognitive task activations. Talk presented at the Organization for Human Brain Mapping, Vancouver, Canada.
5. **Cole M.W.**, Ito T., Schultz D.H., Mill R.D. (March, 2017). Activity flows over task-evoked networks shape cognitive task activations across task switches. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.
6. Ito T., Schultz D., Solomyak L., Chen R., Mill R., **Cole M.W.** (November, 2016). Cognitive control networks route task information to other networks via intrinsic functional connectivity

pathways. Poster presented at the Society for Neuroscience, San Diego, CA.

7. Mill R., Bagic A., Schneider W., **Cole M.W.** (November, 2016). Network signatures of flexible cognitive control are reflected in oscillatory MEG source connectivity. Poster presented at the Society for Neuroscience, San Diego, CA.
8. Schultz D., Ito T., Solomyak L., Chen R., Mill R., Kulkarni K., **Cole M.W.** (November, 2016). Cognitive control network global connectivity is related to the mental health of healthy individuals. Poster presented at the Society for Neuroscience, San Diego, CA.
9. Spronk M., Anticevic A., **Cole M.W.** (November, 2016). Cognitive control network flexible hub connectivity is altered across distinct mental illnesses. Poster presented at the Society for Neuroscience, San Diego, CA.
10. Ito T., Schultz D., Solomyak L., Chen R., Mill R., **Cole M.W.** (August, 2016). Intrinsic functional connectivity shapes task information between networks. Poster presented at the Neural Computation and Psychology Workshop, Philadelphia, PA.
11. **Cole M.W.**, Schultz D., Chen R., Kulkarni K., Ito T. (April, 2016). The cognitive relevance of resting-state fMRI: Spontaneously organized networks and brain states across rest and task. Talk presented at Cognitive Neuroscience Society, New York, NY.
12. Chen R., Kulkarni K., Ito T., **Cole M.W.** (April, 2016). Spontaneously organized brain states revealed by dynamic multivariate pattern analysis of resting state fMRI. Poster presented at Cognitive Neuroscience Society, New York, NY.
13. Mill R., Bagic A., Schneider W., **Cole M.W.** (April, 2016). Empirical validation of directed functional connectivity across fMRI and MEG. Poster presented at Cognitive Neuroscience Society, New York, NY.
14. Schultz D., **Cole M.W.** (April, 2016). General intelligence and the efficiency of task-evoked brain network dynamics. Poster presented at Cognitive Neuroscience Society, New York, NY.
15. Chen R., Shafto P., **Cole M.W.** (October, 2015). Multivariate pattern analysis of resting state activity reveals spontaneously organized brain state dynamics. Poster presented at Society for Neuroscience, Chicago, IL.
16. Schultz D.H., **Cole M.W.** (October, 2015). Efficiency of brain network dynamics associated with cognitive ability. Poster presented at Society for Neuroscience, Chicago, IL.
17. Mill R., Bagic A., Schneider W., **Cole M.W.** (October, 2015). Exploiting sensory reactivation from memory to validate directed functional connectivity measures with fMRI and MEG. Poster presented at Society for Neuroscience, Chicago, IL.
18. **Cole M.W.**, Bassett D.S., Schultz D.H. (October, 2015). Intrinsic and dynamic functional network architectures shape task-evoked activation patterns in the human brain. Poster presented at Society for Neuroscience, Chicago, IL.

19. Yang G.J., Murray J.D., Repovs G., **Cole M.W.**, Wang X.J., Glahn D.C., Pearlson G.D., Krystal J.H., Anticevic A. (October, 2015). Cortical Hierarchy Underlies Preferential Connectivity Disturbances in Schizophrenia. Poster presented at Society for Neuroscience, Chicago, IL.
20. **Cole M.W.**, Yang G. J., Murray J. D., Repovs G., Anticevic A. (November, 2014). Reconceptualizing brain network change as shared signal dynamics. Talk presented at Society for Neuroscience, Washington, DC.
21. Mattar M.G., **Cole M.W.**, Thompson-Schill S.L., Bassett D.S. (November, 2014). A dynamic functional cartography of cognitive systems. Poster presented at Society for Neuroscience, Washington, DC.
22. Schultz, D., & **Cole, M.W.** (April, 2015). Task-general and task-specifying functional brain dynamics. Poster presented at Cognitive Neuroscience Society meeting, San Francisco, CA.
23. **Cole M.W.**, Bassett D., Power J.D., Petersen S. (November, 2013). Multi-task functional connectivity reveals the human brain's dynamic network architecture and stable functional backbone. Poster presented at Society for Neuroscience, San Diego, CA.
24. **Cole M.W.**, Reynolds J.R., Power J.D., and Braver T.S. (October, 2012). Flexible Hubs: A Novel Mechanism for Flexible Cognitive Control. Poster presented at Society for Neuroscience, New Orleans, LA.
25. **Cole M.W.**, Etzel J., and Braver T.S. (April, 2012). Identifying Flexible Hubs: A Novel Mechanism for Flexible Cognitive Control. Talk presented at Cognitive Neuroscience Society, Chicago, IL.
26. **Cole M.W.**, Yarkoni T., Repovs G., and Braver T.S. (November, 2011). Flexible hubs: Global brain connectivity correlates of human intelligence. Talk presented at Society for Neuroscience, Washington, D.C.
27. Repovs, G., Anticevic, A., **Cole, M.W.**, & Barch, D.M. (May, 2011). Simulated comparisons of slow and rapid event-related task-based functional connectivity. Poster presented at Society for Biological Psychiatry; San Francisco, CA.
28. **Cole M.W.**, Yarkoni T., Repovs G., Braver T.S. (April, 2011). Flexible hubs: Global brain connectivity correlates of human intelligence. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.
29. **Cole M.W.**, Braver T. (November, 2010). Task Set Formation: Switching to a Completely Novel Task Enhances Task Switching Costs. Talk presented at Psychonomics, St. Louis, MO.
30. **Cole M.W.**, Zacks J., Etzel J.A., and Braver T. (November, 2010). Independent and distributed coding of task-set decision rules within prefrontal cortex. Poster presented at Society for Neuroscience, San Diego, CA.
31. **Cole M.W.**, Anticevic A., Repovs G., Barch D. (August, 2010). Locus of dysconnectivity: Dorsolateral prefrontal connectivity correlates with the cardinal symptoms of schizophrenia. Poster presented at the Gordan Research Conference: Neurobiology of Cognition, Waterville

Valley, NH.

32. **Cole M.W.**, Bagic A., Kass R., Schneider W. (October, 2009). Rapid Task Learning as a Window into the Neural Basis of Executive Control. Poster presented at Society for Neuroscience, Chicago, IL.
33. Schneider W., Pathak S., Phillips J., and **Cole M.** (2009). High Definition Fiber Tracking Exposes Circuit Diagram for Brain Showing Triarchic Representation, Domain General Control, and Metacognitive Subsystems. In Samsonovich, A. V., Noelle, D., and Mueller, S. (Eds.). *Biologically Inspired Cognitive Architectures II: Papers from the AAAI Fall Symposium*. AAAI Technical Report FS-09-01, Menlo Park, CA: AAAI Press.
34. **Cole M.W.**, Schneider W. (June, 2009). From Symbols to Rules to Complex Behaviors: The Neural Basis of Rapid Instructed Task Learning. Poster presented at Human Brain Mapping, San Francisco, CA.
35. **Cole M.W.**, Pathak S., Schneider W. (June, 2009). Identifying the Brain's Most Globally Interactive Regions. Poster presented at Human Brain Mapping, San Francisco, CA.
36. **Cole M.W.**, Kunkel A., Martins B., Schneider W. (November, 2008). The Neural Basis of Rapid Instructed Task Learning. Poster presented at Society for Neuroscience, Washington, DC.
37. Pathak S.*, **Cole M.W.***, Schneider W. (November, 2008). Identifying the Brain's Most Globally Interactive Regions. Poster presented at Society for Neuroscience, Washington, DC. **First two authors contributed equally*
38. Schneider W., **Cole M.**, and Pathak S. (2008). Reverse engineering the brain with a circuit diagram based on a segmented connectome and system dynamics. In Samsonovich, A. V., Khosla, D., Itti, L., Shanahan, M., Chella, A., Granger, R. H., Mueller, S., Goertzel, B., and Noelle, D. (Eds.). *Biologically Inspired Cognitive Architectures: Papers from the AAAI Fall Symposium*. AAAI Technical Report FS-08-04, Menlo Park, CA: AAAI Press.
39. **Cole M.W.**, Laurent P. (November, 2008). Neurevolution: An Example Of Blogging To Enhance Scientific Communication. Poster presented at Society for Neuroscience, Washington, DC.
40. **Cole M.W.**, Martins B., Schneider W. (April, 2008). The Neural Basis of Rapid Instructed Task Learning. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.
41. Pathak S., Martins B., **Cole M.W.**, Schneider W. (April, 2008). Anatomical and Functional Segmentation of the Cognitive Control Network: Supporting a preliminary cognitive control network connectome. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.
42. **Cole M.W.**, Pathak S., Schneider W. (April, 2008). Medial Frontal Cortex Directs Attention Along Multiple Pathways to Resolve Perceptual Decision Difficulty. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.

43. **Cole M.W.**, Schneider W. (June, 2007). Perceptual Decision Making Is Mediated by the Cognitive Control Network via ACC/pre-SMA to DLPFC Connectivity. Poster presented at Human Brain Mapping, Chicago, IL.
44. **Cole M.W.**, Schneider W. (May, 2007). Causal Connectivity Within a Cognitive Control Network During Perceptual Decision Making. Poster presented at Cognitive Neuroscience Society, New York, NY.
45. **Cole M.W.**, Schneider W. (June, 2006). Dissociation of anterior cingulate, dorsolateral prefrontal, and premotor cortex during a visual search task reveals specialized roles within a commonly activated fronto-parietal network. Poster presented at Human Brain Mapping, Florence, Italy.
46. Schneider W., Siegle G., McHugo M., Gemmer L., Jones D., Fissell K., Koerbel L., Suzuki I., Jung K., Goldberg R., Wheeler M., **Cole M.W.**, Hill N. (June, 2006). 2006 Pittsburgh Brain Activity Interpretation Competition: Inferring Experience Based Cognition from fMRI Data. Poster presented at Human Brain Mapping, Florence, Italy.
47. **Cole M.W.**, Schneider W. (April, 2006). Dissociation of anterior cingulate, dorsolateral prefrontal, and fronto-polar cortex during a visual search task reveals specialized roles within a commonly activated fronto-parietal network. Poster presented at Cognitive Neuroscience Society, San Francisco, CA.
48. **Cole M.W.**, Schneider W. (November, 2005). Less Working Memory, More Control: Greater BOLD Response to Overcoming Prepotency in Prefrontal and Parietal Cortices. Talk presented at Society for Neuroscience, Washington, D.C.
49. Schneider W., Hill N., **Cole M.W.** (November 2005). Native and Supported Mode Processing in Attentional Control Network. Talk presented at Psychonomics, Toronto, Canada.
50. Schneider W., Hill N., Chein J., McHugo M., **Cole M.W.** (November, 2004). Subsystems Supporting attention, decision making, learning, and skilled performance. Talk presented at Psychonomics, Minneapolis, MN.
51. Schumacher E.H., **Cole M.W.**, Singer A., D'Esposito M. (October, 2004). Distinguishing Response Selection Sub-processes with Functional Magnetic Resonance Imaging. Poster presented at Society for Neuroscience, San Diego, CA
52. Schumacher E.H., **Cole M.W.**, Singer A., D'Esposito M. (April, 2004). Distinguishing Response Selection Sub-processes with Functional Magnetic Resonance Imaging. Poster presented at Cognitive Neuroscience Society, San Francisco, CA
53. Curtis C.E., **Cole M.W.**, Rao V., Ollinger J., D'Esposito M. (April, 2004). Canceling planned action: An fMRI study of countermanding saccades. Poster presented at Cognitive Neuroscience Society, San Francisco, CA
54. Curtis C.E., **Cole M.W.**, Rao V., Ollinger J., D'Esposito M. (October, 2003). Canceling planned action: An fMRI study of countermanding saccades. Poster presented at Society for Neuroscience, New Orleans, LA

Service to Peer-reviewed Scientific Journals

Member of editorial boards

Associate Editor for journal *Network Neuroscience* (2016-Present)
Member of the Advisory Board for *Brain Structure and Function* (2015-Present)
Review editor at *Frontiers in Human Neuroscience* (2014-Present)

Ad Hoc Reviewer for Journals

Acta Psychologica
Biological Psychiatry (3x)
Brain
Brain and Language
Brain Connectivity (2x)
Brain Research
Brain Sciences
Brain Structure and Function (6x)
Cerebral Cortex (14x)
Cognition (5x)
Cognitive, Affective & Behav. Neuroscience (2x)
Current Directions in Psychological Science
Frontiers in Human Neuroscience (3x)
Human Brain Mapping (11x)
Journal of Cognitive Neuroscience (6x)
Journal of Experimental Psychology: General
Journal of Neuroscience (21x)
Journal of Neuroscience Methods
Molecular Psychiatry (2x)
Nature Communications (3x)
Nature Neuroscience (4x)
Network Neuroscience (3x)
NeuroImage (39x)
NeuroImage: Clinical (2x)
Neuron (10x)
Neuropsychologia (3x)
Neuroscience & Biobehavioral Reviews (3x)
Personality Neuroscience
Perspectives on Psychological Science
Philosophical Transactions B
PLOS Biology (2x)
PLOS Computational Biology (5x)
PNAS (6x)
Quarterly Journal of Experimental Psychology
Schizophrenia Bulletin
Scientific Reports
The American Journal of Psychiatry

Grant Review Panel Member

The Busch Biomedical Grant Program, 2016
The US National Science Foundation (NSF), 2017
The US National Institutes of Health (NIH), temporary member of Cognition & Perception (CP) study section, 2018

Ad Hoc Reviewer for Grants

The United Kingdom Medical Research Council, 2015
The Netherlands Organization for Scientific Research, 2015
The Wellcome Trust, 2017

Mentoring

Postdoctoral fellows:

Douglas Schultz Summer 2014-
Ravi Mill Spring 2015-
Marjolein Spronk 2015-2017

PhD students:

Richard Chen Fall 2014-
Pinelopi Kyriazi Fall 2014 (rotation)
Takuya Ito Fall 2015-
Carrisa Cocuzza Fall 2016-
Katherine Wolfert Fall 2017 (rotation)

Faculty:

Brian Keane (mentor on NIH K01) 2016-

Full-time research assistants at Rutgers University-Newark:

Levi Solomyak 2014-2016
Takuya Ito 2014-2015
Kaustubh Kulkarni (*now MD-PhD student at Icahn School of Medicine at Mount Sinai*) Fall 2015-Summer 2017
Julia Hamilton Summer 2017-

Undergraduate research assistants at Rutgers University-Newark:

Sara Horton (Summer 2015, Summer 2016), Brayano Zambrano (2016; received NIH LSAMP fellowship), Miguel Vivar (2016-2017; received McNair Scholar award, NIH LSAMP fellowship, and Aresty Fellowship), Ryan Welch (2015-2017; high school student), Nicole Lalta (2017-; NIH LSAMP fellowship), Brian Siaw (2017; NIH LSAMP fellowship)

Member of Ph.D. thesis committee for:

Dana Mastrovito (Spring 2016-), Kainan Sally Wang (Summer 2017-)

Outside member of Ph.D. thesis committee for:

Luke Hearne (The University of Queensland, 2017), Co-mentor and member of PhD committee for Alisha Janssen, clinical psychology PhD student at the Ohio State University (2014-2016)

Research assistants at Washington University (2009-2013):

Lauren Patrick, Nicholas Fazzio, Jordan Livingston, Takuya Ito, Lauren Ness, Maria Chushak, Cameron Smith

Research assistants at the University of Pittsburgh (2004-2009):

Eliezer Kanal, Sudhir Pathak, Amber Kunkel, Anderson Tesfazion

Teaching Experience

Spring 2016 Course developer and instructor for Network & Complexity Neuroscience, a graduate-level course at Rutgers University-Newark

Fall 2015 Course developer and lead instructor for Foundations in Neuroscience III, a graduate-level course at Rutgers University-Newark

Spring 2015 Co-instructor for Critical Thinking in Neuroscience course, Rutgers University-Newark

Spring 2012 Co-instructor (with Todd Braver) for *Functional Neuroimaging*, Washington University in St. Louis

- 2011 Guest lecturer for *Cognitive Neuroscience* (Instructor: Todd Braver), Washington University in St. Louis
- 2010 Guest lecturer for *Cognitive Neuroscience* (Instructor: Todd Braver), Washington University in St. Louis
- Fall 2006 Teaching assistant for *Introduction to Neuroscience* (Instructor: David Wood), University of Pittsburgh
- Spring 2006 Guest lecturer for *Laboratory on fMRI Data Acquisition and Analysis* (Instructor: Walter Schneider), University of Pittsburgh
- Spring 2003 Teaching assistant for *The Neural Basis of Language and Thought* (Instructors: Jerome Feldman and George Lakoff), UC Berkeley