

Patrick H. Cox, PhD

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Employment & Education

Academic Appointments

2021–Present	Intelligence Community Postdoctoral Fellow	The George Washington University The National Geospatial Agency Advisors: Stephen Mitroff (GWU), Dwight Kravitz (GWU), Joeanna Arthur (NGA), and Jack Brandy (NGA)
2017–2021	Postdoctoral Fellow, Department of Psychological and Brain Sciences	The George Washington University Advisor: Stephen Mitroff
2008–2010	Lab Manager, Laboratory for Computational Cognitive Neuroscience	Georgetown University

Education

2017	PhD, Neuroscience	Georgetown University Advisor: Maximilian Riesenhuber
2008	BS, Physics <i>Minor: Cognitive Science</i> <i>Graduated cum laude with honors in Physics</i>	Georgetown University

Funding

<i>Title:</i>	Neural Pathways and Neuroplasticity in Geospatial Expertise Acquisition
<i>Funding Source:</i>	Intelligence Community Postdoctoral Research Fellowship Program, Office of the Director of National Intelligence
<i>PI:</i>	Patrick H. Cox
<i>Grant period:</i>	October 1, 2021 through September 30, 2023
<i>Total funding:</i>	\$204,000
<i>Title:</i>	Short Term Innovative Research Award: Quantifying the Effects of Target and Distractor Similarity in Complex Visual Search
<i>Funding Source:</i>	Army Research Office Award # W911NF-20-1-0325
<i>PI:</i>	Patrick H. Cox
<i>Co-PI:</i>	Stephen R. Mitroff

Grant period: August 12, 2019 through May 11, 2021
Total funding: \$59,446

Title: Doctoral Research Funding
Funding Source: Metropolitan Washington Chapter of the ARCS Foundation
PI: Patrick H. Cox
Grant period: June 13, 2014 through May 5, 2015
Total funding: \$15,000

Publications & Presentations

* Indicates co-first authors

Publications

1. Mitroff, S. R., Siritzky, E. M., Nag, S., **Cox, P. H.**, Callahan-Flintoft, C., Tweedell, A., Kravitz, D. J., Oie, K. S. (2022). The importance of assessing both expert and non-expert populations to inform expert performance. In Wright & D. Barber (Eds.), *Human factors and simulation (Vol. 30)*, (pp. 11–17). Applied Human Factors and Ergonomics (AHFE) International. <http://doi.org/10.54941/ahfe1001486>
2. Grady, J. N., **Cox, P. H.**, Nag, S., & Mitroff, S. R. (2022). Conscientiousness protects against the negative impact of fatigue on visual search performance. *Cognitive Research: Principles and Implications*, 7(56). <https://doi.org/10.1186/s41235-022-00410-9>
3. Silverman, M. E., Nag, S., Kalishman, A., **Cox, P. H.**, & Mitroff, S. R. (2022). Increases in symptoms associated with obsessive-compulsive disorder among university students during the COVID-19 pandemic. *Journal of American College Health*. <https://doi.org/10.1080/07448481.2022.2080507>
4. Kramer, M. R., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2022). A precise quantification of how prior experience informs current behavior. *Journal of Experimental Psychology: General*, 151(8), 1854–1865. <https://doi.org/10.1037/xge0001119>
5. **Cox, P. H.**, Kravitz, D. J. & Mitroff, S. R. (2021). Great expectations: minor differences in initial instructions have a major impact on visual search in the absence of feedback. *Cognitive Research: Principles & Implications*, 6(19). <https://doi.org/10.1186/s41235-021-00286-1>
6. Kramer, M. R., **Cox, P. H.**, Yu, A. B., Kravitz, D. J., & Mitroff, S. R. (2021). Moving Beyond the Keypress: As Technology Advances, so Should Psychology Response Time Measurements. *Perception*, 50(6), 555–565. <https://doi.org/10.1177/03010066211012356>
7. Porfido, C. L., **Cox, P. H.**, Adamo, S. H., & Mitroff, S. R. (2020). Recruiting from the shallow end of the pool: Differences in cognitive and compliance measures for subject pool participants based on enrollment time across an academic term. *Visual Cognition*, 28(1), 1–9. <https://doi.org/10.1080/13506285.2019.1702602>
8. Martin, J. G., **Cox, P. H.**, Scholl, C. A., & Riesenhuber, M. A. (2019). Crash in visual processing: Interference between feedforward and feedback of successive targets limits detection and categorization. *Journal of Vision*, 19(12). <https://doi.org/10.1167/19.12.20>
9. *Adamo, S. H., ***Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2019). How to correctly put the “subsequent” in subsequent search miss errors. *Attention Perception & Psychophysics*, 81, 2648–2657. <https://doi.org/10.3758/s13414-019-01802-8>

10. **Cox, P. H.** & Riesenhuber, M. (2015). There's a 'U' in clutter: Evidence for sparse codes underlying clutter tolerance in human vision. *Journal of Neuroscience*, 35(42), 14148–14159.
<https://doi.org/10.1523/JNEUROSCI.1211-15.2015>
11. Jiang, X., Bollich, A., **Cox, P. H.**, Hyder, E., James, J., Gowani, S. A., Hadjikhani, N., Blanz, V., Manoach, D. S., Barton, J. J. S., Gaillard, W. D., & Riesenhuber, M. (2013). A quantitative link between face discrimination deficits and neuronal selectivity for faces in autism. *NeuroImage: Clinical*, 2(1), 320–331.
<https://doi.org/10.1016/j.nicl.2013.02.002>

Manuscripts in Preparation

1. **Cox, P. H.**, Scholl, C. A., Sprouse, C.A., Jiang, X., & Riesenhuber, M. (in preparation). Escaping the frontal bottleneck: Extensive practice of a visual categorization task shifts category representations from dorsolateral prefrontal cortex to ventral occipito-temporal cortex.
2. **Cox, P. H.**, Callahan-Flintoff, C., Kramer, M. R., Mitroff, S. R., & Kravitz, D. J. (in preparation). Demonstrating dissociable time scales of implicit learning in human behavior consistent with mechanisms of synaptic change.
3. **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (in preparation). Modeling changes in the effect of target-distractor similarity on complex visual search performance as a function of experience.
4. Damera, S. R., Chang, L., Nikolov, P. P., Mattei, J. A., Banerjee, S., Glezer, L. S., **Cox, P. H.**, Jiang, X., Rauschecker, J. P., & Riesenhuber, M. (submitted). Evidence for a Spoken Word Lexicon in the Auditory Ventral Stream
5. Mitroff, S. R., **Cox, P. H.**, Siritzky, E. M., Nadler, S. M., & Kravitz D. J. (under revision). Standard experimental paradigm designs and data exclusion practices in cognitive psychology can inadvertently introduce systematic biases in participant samples.

Invited Talks

1. **Cox, P. H.** (2022, September). Leveraging Large Datasets and Representational Similarity to Understand Complex Visual Search. Annual Intelligence Community Academic Research Symposium.
2. **Cox, P. H.** (2021, February). Leveraging analysis techniques inspired by brain imaging to gain insights into human cognition from behavioral “big data”. OnNeuro: Live Online Neuroscience and Psychology Conference. <https://www.youtube.com/watch?v=fKY6LNiaSaE&t=2s>
3. **Cox, P. H.** (2017, March). The effects of extensive single task and dual task training on visual object recognition: Escaping the frontal bottleneck. Human Research & Engineering Directorate, Army Research Laboratory, Aberdeen, MD.

Conference Presentations

1. **Cox, P. H.**, Yousefi, A., Kravitz, D. J., & Mitroff, S. R. (2022, November). Leveraging large datasets and representational similarity to understand complex visual cognition. Poster to be presented at the annual Object Perception, Attention, and Memory meeting, Boston, MA.
2. Nadler, M. S., Nag, S., **Cox, P. H.**, Siritzky, E. M., Kravitz, D. J., & Mitroff, S. R. (2022, November). Obsessive-compulsive disorder symptomatology for unacceptable thoughts hinders visual search ability. Poster to be presented at the annual Object Perception, Attention, and Memory meeting, Boston, MA.

3. Nag, S., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2022, November). Task-irrelevant features drive both general and stimulus-specific post-inhibition deficits. Poster to be presented at the annual Object Perception, Attention, and Memory meeting, Boston, MA.
4. Nag, S., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2022, November). Task-irrelevant features drive both general and stimulus-specific post-inhibition effects. Paper to be presented at the annual meeting of the Psychonomic Society, Boston, MA.
5. Fitzhugh, S. M., Nag, S., Oie, K., Cox, P. H., Kravitz, D. J., & Mitroff, S. R. (2022, September). Leveraging bigger data to predict rare outcomes in user engagement. Talk presented at DoD 6.1 Basic Research Conference, Arlington, VA.
6. Nag, S., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2022, May). Post-inhibition deficits are shaped by task-irrelevant feature similarity. Paper presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
7. Callahan-Flintoff, C., Nag, S., **Cox, P. H.**, Siritzky, E. M., Oie, K. S., Kravitz, D. J., & Mitroff, S. R. (2022, May). Leveraging big data to disentangle effects of distractor interference and improve prediction of visual search performance. Poster presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
8. Grady, J. N., **Cox, P. H.**, Nag, S., & Mitroff, S. R. (2022, May). Conscientiousness protects visual search performance from the impact of fatigue. Poster presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
9. **Cox, P. H.**, Yousefi, A., Kravitz, D. J., & Mitroff, S. R. (2021, November). Modeling changes in the effect of target-distractor similarity on complex visual search performance as a function of experience. Paper presented at the annual meeting of the Psychonomic Society.
10. Oie, K. S., Mitroff, S. R., Kravitz, D. J., & **Cox, P. H.** (2021, November). Perspectives on the challenges and potential rewards of addressing real-world complexity for the translation of fundamental science to application. Paper presented at the annual meeting of the Psychonomic Society.
11. **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2021, May). You are the type of searcher you are instructed to be: The impact of task instructions on search in the absence of feedback. Poster presented at the annual meeting of the Vision Sciences Society.
12. **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2020, November). You find what you expect: Initial expectations create self-reinforcing biases in visual search without feedback. Paper presented at the annual meeting of the Psychonomic Society.
13. Kramer, M. R., **Cox, P. H.**, Yu, A., Mitroff, S. R., & Kravitz, D. J. (2020, November). Demonstrating dissociable time scales of implicit learning in human behavior consistent with mechanisms of synaptic change. Paper presented at the annual meeting of the Psychonomic Society.
14. Yu, A., **Cox, P. H.**, Nag, S., Kramer, M. R., Spangler, D., Kravitz, D. J., & Mitroff, S. R. (2020, November). Ebb and flow of visual search: Variability in human visual search performance as a function of time. Poster presented at the annual meeting of the Psychonomic Society.
15. Kramer, M. R., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2020, November). What you've seen is what you expect: How prior experiences influence visual search performance. Paper presented at the annual Object Perception, Attention, and Memory meeting.
16. Porfido, C. L., **Cox, P. H.**, Adamo, S. H., & Mitroff, S. R. (2019, November). Perils of using psychology subject pools for cognitive psychology research. Paper presented at the annual meeting of the Psychonomic Society, Montreal, Canada.

17. Kramer, M. R., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2019, November). Using big data to investigate the short-term and long-term synaptic maintenance of implicit learning. Poster presented at the annual meeting of the Psychonomic Society, Montreal, Canada.
18. **Cox, P. H.**, Adamo, S. H., Porfido, C. L., Kravitz, D. J., & Mitroff, S. R. (2019, November). A miss in the subsequent search miss (SSM) effect: Proper quantification of an important phenomenon in visual search. Poster presented at the annual Object Perception, Attention, and Memory meeting, Montreal, Canada.
19. Porfido, C. L., **Cox, P. H.**, Adamo, S. H., & Mitroff, S. R. (2019, November). Recruiting from the shallow end of the pool: Cognitive performance and study compliance differ between participant pool subjects from the start to the end of an academic term. Poster presented at the annual Object Perception, Attention, and Memory meeting, Montreal, Canada.
20. Kramer, M. R., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2019, October). Using a massive behavioral dataset to investigate the synaptic maintenance of implicit learning. Poster presented at the annual meeting of the Society for Neuroscience, Chicago, IL.
21. **Cox, P. H.**, Kramer, M. R., Mitroff, S. R., & Kravitz, D. J. (2019, July). Modeling and removing the effect of trial-by-trial carryover effects. Paper presented at the Mid-Atlantic Meeting on Memory and Attention, Philadelphia, PA.
22. Adamo, S. H., **Cox, P. H.**, Kravitz, D. J. & Mitroff, S. R. (2019, May). Accurately quantifying the subsequent search miss effect in multiple-target visual search. Paper presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
23. **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2019, May). Changes in target-distractor similarity space with experience in complex visual search. Poster presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
24. Kramer, M. R., **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2019, May). A big data approach to revealing the nature of carryover effects. Poster presented at the annual meeting of the Vision Sciences Society, St. Pete Beach, FL.
25. Kramer, M. R., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2019, April). The massive impact of carryover effects: Behavior is dramatically and systematically shaped by prior trials. Paper presented at the annual GW Institute for Neuroscience Symposium, Washington, DC.
26. Kramer, M. R., Porfido, C. L., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2019, March). Generalized training for visual search. Paper presented at the 73rd meeting of the Department of Defense Human Factors Engineering Technical Advisory Group, Aberdeen, MD.
27. Kramer, M. R., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2019, January). The massive impact of carryover effects: Behavior is dramatically and systematically shaped by prior trials. Paper presented at the annual Capital Area Cognition, Attention, and Perception conference, Washington, DC.
28. Kramer, M. R., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2018, November). Revealing the nature of carryover effects: Using big data to quantify evidence accumulation in behavioral data. Poster presented at the annual meeting of the Psychonomic Society, New Orleans, LA.
29. Kravitz, D. J., Kramer, M. R., **Cox, P. H.**, & Mitroff, S. R. (2018, November). The dominance of individual differences and short-term adaptation: insights from “Big Data.” Paper presented at the annual meeting of the Psychonomic Society, New Orleans, LA.
30. Mitroff, S. R., Kramer, M. R., **Cox, P.**, & Kravitz, D. J. (2018, November). Using big data to improve research practices in the lab. Paper presented at the annual meeting of the Psychonomic Society, New Orleans, LA.

31. Kramer, M. R., **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2018, November). The massive impact of carryover effects: Behavior is dramatically and systematically shaped by prior trials. Paper presented at the annual Object Perception, Attention, and Memory meeting, New Orleans, LA.
32. **Cox, P. H.**, Mitroff, S. R., & Kravitz, D. J. (2018, November). Mapping the behavioral similarity space of targets and distractors in complex visual search. Poster presented at the annual Object Perception, Attention, and Memory meeting, New Orleans, LA.
33. **Cox, P. H.**, Kravitz, D. J., & Mitroff, S. R. (2018, May). Predicting ultimate visual search competency from initial performance. Paper presented at the annual meeting of the Vision Science Society, St. Pete Beach, FL.
34. **Cox, P. H.**, Scholl, C. A., Sprouse, C. A., Ronkin, J. C., Klein, R. L., Wimmer, K., Glomb, K., Jaimes, N. E., Deco, G., Jiang, X., & Riesenhuber, M. (2017, November). Escaping the frontal bottleneck: Extensive practice of a visual categorization task shifts category representations from dorsolateral prefrontal cortex to ventral occipito-temporal cortex. Poster presented at the annual Society for Neuroscience Meeting, Washington, DC.
35. Schubel, L. C., **Cox, P. H.**, Kramer, M. R., Kravitz, D. J., & Mitroff, S. R. (2017, November). What most distracts us?: Using "big data" to understand the effect of target-distractor similarity in visual search. Poster presented at the annual Object Perception, Attention, and Memory meeting, Vancouver, BC.
36. **Cox, P. H.** & Riesenhuber, M. (2014, November). There's a 'U' in clutter: Evidence for sparse codes underlying clutter tolerance in human vision. Poster presented at the Society for Neuroscience Meeting, Washington, DC.
37. Scholl C. A., **Cox P. H.**, Jaimes N., Jiang X., & Riesenhuber M. (2014, November). A comparison of neural substrates and temporal dynamics underlying a recently learned and extensively practiced visual object categorization task. Poster presented at the annual Society for Neuroscience meeting, Washington, DC.
38. **Cox, P. H.**, Washington, S., Gordon, E. M., Brar, J., Girton, L., Hailu, A., Wolfe, A., Warburton, S., Mbwana, J., Gaillard, W., Kalbfleisch, M. L., & Van Meter, J. (2011, June). Reduced functional connectivity of the amygdala and dorsal anterior cingulate in autism spectrum disorder (ASD). Poster presented at the Organization for Human Brain Mapping meeting, Quebec City, Canada.
39. Jiang, X., Bollich, A., **Cox, P. H.**, Hyder, E., James, J., Gowani, S., Blanz, V., Hadjikhani, N., Manoach, D. S., Gaillard, W., & Riesenhuber, M. (2008, November). The heterogeneity of face perception deficits in autism spectrum disorder (ASD) might be caused by tuning differences of neurons in the fusiform face area (FFA)—a pilot study. Poster presented at the annual Society for Neuroscience meeting, Washington, DC.

Professional Service

University and Organizational Service

President, Postdoctoral Association, The George Washington University	2021
Vice President, Postdoctoral Association, The George Washington University	2020
Organizer, Object Perception, Attention, and Memory Conference	2019, 2020
Captain, Interdisciplinary Program in Neuroscience Softball Team	2013–2014
Assistant Captain, Interdisciplinary Program in Neuroscience Softball Team	2010–2013
Member, Student Advisory Committee, Interdisciplinary Program in Neuroscience	2011–2014
President, Society of Physics Students, Georgetown University	2007–2008

Ad-hoc Journal Reviewing

Acta Psychologica
 Attention, Perception, & Psychophysics
 Cognitive Research: Principles and Implications
 Journal of Experimental Psychology: Applied
 Journal of Experimental Psychology: General
 Psychonomic Bulletin & Review
 Quarterly Journal of Experimental Psychology

Ad-hoc Grant Reviewing

Georgetown Medical Center Graduate Student Organization Student Research Grant Program
 United States Army Research Laboratory

TeachingCourses Co-Taught

Fall 2019	GWU	Foundations of Experimental Neuroscience II
Summer 2017	Georgetown	Introduction to Neurophysiology
Spring 2012–Spring 2016	Georgetown	Systems and Cognitive Neuroscience
Fall 2013–Fall 2015	Georgetown	Drugs, the Brain and Behavior I
Summer 2010–Summer 2015	Georgetown	Special Topics in Neuroscience
Spring 2011–Spring 2015	Georgetown	Drugs, the Brain and Behavior II
Summer 2010–Summer 2015	Georgetown	Introduction to Cognitive Science

Guest Lecturer

Fall 2021	GWU	Cognitive Science in the District
Spring 2019	GWU	Cognitive Psychology

Teaching Assistant

Spring 2012	Georgetown	Principles of Nervous System Organization & Function (anatomy lab)
Spring 2012–Spring 2016	Georgetown	Research Modules in Cognitive Science
Spring 2008	Georgetown	Electrodynamics and Optics
Spring 2008	Georgetown	Principles of Physics II (lab)
Fall 2007	Georgetown	Quantum Mechanics
Summer 2007	Georgetown	Principles of Physics I (lecture)
Spring–Summer 2007	Georgetown	Principles of Physics II (lecture)
Spring–Summer 2007	Georgetown	Principles of Physics II (lab)

Lab Designer

Summer 2007	Georgetown	Principles of Physics II (lab)
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Advising

Justin Grady	GW Undergrad
Artin Yousefi	GW Undergrad
Sydney Nadler	GW Undergrad
Lina Qi	GW Undergrad

Rose Barrelier	GW Undergrad
Jinqiu Wang	GW Undergrad
Jasen Chan	GW Undergrad
Jason Ronkin	GU Undergrad
Jonathan Simons	GU Post-bac
Long Lu	GU Post-bac
Yanni Anagnostopoulos	High School Student
Jay Hebert	High School Student
Philip Cho	High School Student

Awards and Honors

Second Place Award, GWU Postdoc Appreciation Day Poster Competition, 2019

Travel Award, Vision Sciences Society, 2019

Scholar, Washington Chapter of Achievement Rewards for College Scientists Foundation, 2014–2015

Semifinalist, Department of Defense Science, Mathematics, and Research for Transformation (SMART)

Scholarship Program, 2012

Awardee, Traedo Medal (Undergraduate Physics Award), Georgetown University, 2008

Awardee, Undergraduate Research Opportunities Program, 2006–2007