C. BROCK KIRWAN, Ph.D.

1052 KMBL, Provo, UT 84602, USA
Phone: +1 (801) 422-2532
kirwan@byu.edu
http://kirwanlab.org

ACADEMIC & RESEARCH POSITIONS

2020-Present **Professor**, Department of Psychology & Neuroscience Center, Brigham Young University

2016-Present **Director**, MRI Research Facility, Brigham Young University

2010-Present **Adjunct Assistant Professor**, Department of Psychology, University of Utah

2015-2020 **Associate Professor**, Department of Psychology & Neuroscience Center, Brigham Young University

2009-2015 **Assistant Professor**, Department of Psychology & Neuroscience Center, Brigham Young University

2006-2009 **Postdoctoral Fellow**, Department of Psychiatry, University of California, San Diego

2006-2009 **Lecturer**, Department of Psychology, San Diego State University

EDUCATION

Ph.D.	**Johns Hopkins University:** Psychological and Brain Sciences	2006
M.A.	**Johns Hopkins University:** Psychology	2004
B.S.	**University of Utah:** Psychology, *cum laude*	2001
B.S.	**University of Utah:** Philosophy, *cum laude*	2001

SCHOLARLY METRICS

- 3,666 citations per Google Scholar
- 28 h-index

PUBLICATIONS

**undergraduate or *graduate student trainee authors

52. Efraim, M., Bailey, B., **Kirwan, C. B.,** Muncy, N. M.*, Tucker, & Kwon, S. (2020). Acute after-school screen time in children decreases impulse control and activation toward high-calorie food stimuli in brain regions related to reward and attention. *Brain Imaging and Behavior*. https://doi.org/10.1007/s11682-019-00244-y

51. Carbine, K. A., Duraccio, K. M., Hedges-Muncy, A. M.*, Barnett, K. A., **Kirwan, C. B.**, & Jensen, C. D. (2020). White matter integrity disparities between normal-weight and overweight/obese

adolescents: An automated fiber quantification tractography study. *Brain Imaging and Behavior, 14*, 308-319. https://doi.org/10.1007/s11682-019-00036-4

50. Stark, S. M., **Kirwan, C. B.**, & Stark, C. E. L. (2019). Mnemonic Similarity Task: A tool for assessing hippocampal integrity. *Trends in Cognitive Sciences, 23*(11), 938-951. https://doi.org/10.1016/j.tics.2019.08.003

49. Hermann, P., Gál, V., Kóbor, I., **Kirwan, C. B.**, Kovács, P., Kitka, T., Lengyel, Zs., Bálint, E., Varga, B., Csekő, Cs., & Vidnyánszky, Z. (2019). Efficacy of weight loss intervention can be predicted based on early alterations of fMRI food cue reactivity in the striatum. *NeuroImage: Clinical, 23*, 101803. https://doi.org/10.1016/j.nicl.2019.101803

48. Jensen, C. D., Duraccio, K. M., Barnett., K. A., Carbine, K. A., Stevens, K., Muncy, N. M.*, & **Kirwan, C. B.** (2019). Sleep duration differentially affects brain activation in response to food images in adolescents with overweight/obesity compared to adolescents with normal weight. *Sleep, 42*(4), zsz001 https://doi.org/10.1093/sleep/zsz001

47. Meservy, T., Fadel, K., **Kirwan, C. B.**, Meservy, R. (2019). An fMRI exploration of information processing in electronic networks of practice. *Management Information Systems Quarterly*, *43*(3), 851-872. https://doi.org/10.25300/MISQ/2019/15093

46. Carbine, K. A., Duraccio, K. M., **Kirwan, C. B.**, Muncy, N. M.*, LeCheminant, J. D., & Larson, M. J. (2018). A direct comparison between ERP and fMRI measurements of food-related inhibitory control: Implications for BMI status and dietary intake. *NeuroImage*, *16,* 335-348. https://doi.org/10.1016/j.neuroimage.2017.11.008

45. Vance. A., Jenkins, J. L., Anderson, B. B., Bjornn, D. K.*, & **Kirwan, C. B.** (2018). Tuning out security warnings: A longitudinal examination of habituation through fMRI, eye tracking, and field experiments. *Management Information Systems Quarterly, 43*(2), 1-26. https://doi.org/10.25300/MISQ/2018/14124

44. Doxey, C. R.*, Hodges, C. B.*, Bodily, T.*, Muncy, N. M.*, & **Kirwan, C. B.** (2018). The effects of sleep on the neural correlates of pattern separation. *Hippocampus*, *28*(2), 108-120. https://doi.org/10.1002/hipo.22814

43. Masterson, T. D., **Kirwan, C. B.**, Davidson, L. E., Larson, M. J., Keller, K. L., Fearnbach, S. N., Evans, A., & LeCheminant, J. D. (2018). Brain reactivity to visual food stimuli after moderate-intensity exercise in children. *Brain Imaging and Behavior, 12*(4), 1032-1041. https://doi.org/10.1007/s11682-017-9766-z

42. Muncy, N. M.*, Hedges-Muncy, A.*, & **Kirwan, C. B.** (2017). Discrete pre-processing step effects in registration-based pipelines: A preliminary volumetric study on T1-weighted images. *PLoS ONE*, *12*(10), e0186071. https://doi.org/10.1371/journal.pone.0186071

41. Wright, K. L., **Kirwan, C. B.**, Gale, S. D., Levan, A. J., Hopkins, R. O. (2017). Long-term cognitive and neuroanatomical stability in patients with anoxic amnesia: A case report. *Brain Injury*, *31*(5), 709-716. https://doi.org/10.1080/02699052.2017.1285051

40. Jensen, C. D., Duraccio, K. M., Carbine, K. A. Barnett., K. A., & **Kirwan, C. B.** (2016). Motivational impact of palatable food correlates with functional brain responses to food images in adolescents. *Journal of Pediatric Psychology, 42*(5), 578-587. https://doi.org/10.1093/jpepsy/jsw091

39. Anderson, B. B., Jenkins, J. L., Vance, A., **Kirwan, C. B.**, Eargle, D. (2016). Your memory is working against you: How eye tracking and memory explain habituation to security warnings. *Decision Support Systems*, *92*, 3-13. https://doi.org/10.1016/j.dss.2016.09.010

38. Anderson, B. B., Vance, A., **Kirwan, C. B.**, Jenkins, J. L., Eargle, D. (2016). From warning to wallpaper: Why the brain habituates to security warnings. *Journal of Management Information Systems. 30*(3), 713-743. https://doi.org/10.1080/07421222.2016.1243947

37. Anderson, M. L.*, James, J. R.*, & **Kirwan, C. B.** (2016). An event-related potential investigation of pattern separation and pattern completion processes. *Cognitive Neuroscience. 8*(1), 9-23. https://doi.org/10.1080/17588928.2016.1195804

36. Jenkins, J., Anderson, B. B., Vance, A., **Kirwan, C. B.** & Eargle, D. (2016). More harm than good? How messages that interrupt can make us vulnerable. *Information Systems Research*. 27(4), 880-896. https://doi.org/10.1287/isre.2016.0644

35. Vance, A., Anderson, B. B., **Kirwan, C. B.**, & Eargle, D., Jenkins, J. (2016). How users perceive and respond to security messages: A NeuroIS research agenda and empirical study. *European Journal of Information Systems, 25*, 364-390. https://doi.org/10.1057/ejis.2015.21

34. Larson, M. J., Clayson, P. E., **Kirwan, C. B.**, & Weissman, D. H. (2016). Event-related Potential (ERP) indices of congruency sequence effects without feature integration. *Psychophysiology, 53*(6), 814-822. https://doi.org/10.1111/psyp.12625

33. Top, D. N, Stephenson, K., South, M. D., Doxey, C. R.*, & **Kirwan, C. B.** (2016). Atypical amygdala response to fear conditioning in autism spectrum disorder. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging, 1*(4), 308-315. https://doi.org/10.1016/j.bpsc.2016.01.008

32. Masterson, T. D., **Kirwan, C. B.**, Davidson, L. E., & LeCheminant, J. D. (2016) Neural reactivity to visual food stimuli is reduced in some areas of the brain during evening hours compared to morning: an fMRI study in women. *Brain Imaging and Behavior, 10*, 68-78. https://doi.org/10.1007/s11682-015-9366-8

31. Anderson, B. B., **Kirwan, C. B.**, Eargle, D., Jensen, S. R., Vance, A. (2015). Neural correlates of gender differences and color in distinguishing security warnings and legitimate websites: A neurosecurity study. *Journal of Cybersecurity, 1*(1), 109-120. https://doi.org/10.1093/cybsec/tyv005

30. Levan, A., Black, G., Mietchen, J., Baxter, L., **Kirwan, C. B.**, & Gale, S. D. (2015) Right frontal pole cortical thickness and executive functioning in children with traumatic brain injury: The impact on social problems. *Brain Imaging and Behavior, 10*(4), 1090-1095. https://doi.org/10.1007/s11682-015-9472-7

29. South, M., Nielson, C. A., Stephenson, K. G., Maisel, M. E., Top, D. N., & **Kirwan, C. B.** (2015). Overactive pattern separation memory associated with negative emotionality in adults diagnosed with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*(11), 3458-3467. https://doi.org/10.1007/s10803-015-2547-x

28. Jensen, C. D., Duraccio, K. M., Carbine, K. A. & **Kirwan, C. B.** (2015). Topical review: Unique contributions of magnetic resonance imaging to pediatric psychology research. *Journal of Pediatric Psychology*, *41*(2):204-209. https://doi.org/10.1093/jpepsy/jsv065

27. Doxey, C. R.* & **Kirwan, C. B.** (2015). Structural and functional correlates of behavioral pattern separation in the hippocampus and medial temporal lobe. *Hippocampus, 25*(4), 524-533. https://doi.org/10.1002/hipo.22389

26. Jensen, C. D. & **Kirwan, C. B.** (2015). Functional brain response to food images in successful adolescent weight losers compared to normal weight and overweight controls. *Obesity, 23*(3), 630-636. https://doi.org/10.1002/oby.21004

25. Flom, R., Janis, R. B., Garcia, D. J. & **Kirwan, C. B.** (2014). The effects of exposure to dynamic expressions of affect on 5-Month-olds' memory. *Infant Behavior and Development, 37*(4), 752-759. https://doi.org/10.1016/j.infbeh.2014.09.006

24. Vance, A., Anderson, B., **Kirwan, C. B.**, & Eargle, D. (2014). Using measures of risk perception to predict information security behavior: Insights from electroencephalography (EEG). *Journal of the Association for Information Systems*, *15*(10), 679-722. link

23. **Kirwan, C. B.**, Ashby, S. R.**, & Nash, M. I.* (2014). Remembering and imagining differentially engage the hippocampus: A multivariate fMRI investigation. *Cognitive Neuroscience*, *5*(3-4), 1-9. https://doi.org/10.1080/17588928.2014.933203

22. Smith, C. N., Jeneson, A., Frascino, J. C., **Kirwan, C. B.,** Hopkins, R. O., & Squire, L. R. (2014). When recognition memory is independent of hippocampal function. *Proceedings of the National Academy of Sciences*, *111*(27), 9935-9940. https://doi.org/10.1073/pnas.1409878111

21. Levan, A., Baxter, L., **Kirwan, C. B.**, Black, G., & Gale, S. D. (2014). Right frontal pole cortical thickness and social competence in children with chronic traumatic brain injury: Cognitive proficiency as a mediator. *Journal of Head Trauma Rehabilitation*, *30*(2), E24-31. https://doi.org/10.1097/HTR.0000000000000040

20. South, M., Chamberlain, P. D., Wigham, S., Newton, T., Gray, L., Freeston, M., Parr, J., McConachie, H., Le Couter, A., **Kirwan, C. B.**, & Rogers, J. (2014). Enhanced decision making and risk avoidance in young people with high-functioning Autism Spectrum Disorder. *Neuropsychology, 28*(2), 222-228. https://doi.org/10.1037/neu0000016

19. Shelton, D. J.* & **Kirwan, C. B.** (2013). A possible negative influence of depression on the ability to overcome memory interference. *Behavioral Brain Research, 256*, 20-26. https://doi.org/10.1016/j.bbr.2013.08.016

18. Holden, H. M., Toner, C., Pirogovsky, E., **Kirwan, C. B.**, & Gilbert, P. E. (2013). Visual object pattern separation varies in older adults. *Learning and Memory, 20*, 348-351. https://doi.org/10.1101/lm.030171.112

17. Larson, M. J., Gray, A. C., Clayson, P. E., Jones, R., & **Kirwan, C. B.** (2013). What are the influences of orthogonally-manipulated valence and arousal on performance monitoring processes? The effects of affective state. *International Journal of Psychophysiology*, *87*(3), 327-339. https://doi.org/10.1016/j.ijpsycho.2013.01.005

16. Motley, S. E* & **Kirwan, C. B.** (2012). A parametric investigation of pattern separation processes in the medial temporal lobe. *Journal of Neuroscience, 32*(28), 13076-13084. https://doi.org/10.1523/JNEUROSCI.5920-11.2012

15. **Kirwan, C. B.,** Hartshorn, A.**, Stark, S. M., Goodrich-Hunsaker, N. J., Hopkins, R. O. & Stark, C. E. L. (2012). Pattern separation deficits following damage to the hippocampus. *Neuropsychologia*, *50*, 2408-2414. https://doi.org/10.1016/j.neuropsychologia.2012.06.011

14. Jeneson, A., **Kirwan, C. B.**, & Squire, L. R. (2010). Recognition without awareness: An elusive phenomenon. *Learning and Memory*, *17*, 454-459. https://doi.org/10.1101/lm.1815010

13. **Kirwan, C. B.,** Wixted, J. T., & Squire, L. R. (2010). A demonstration that the hippocampus supports both recollection and familiarity. *Proceedings of the National Academy of Sciences, 107*(1), 344-348. https://doi.org/10.1073/pnas.0912543107

12. Jeneson, A., **Kirwan, C. B.,** Hopkins, R. O., Wixted, J. T., & Squire, L. R. (2010). Recognition memory and the hippocampus: A test of the hippocampal contribution to recollection and familiarity. *Learning and Memory*, *17*, 852-859. https://doi.org/10.1101/lm.1546110

11. **Kirwan, C. B.,** Shrager, Y, & Squire, L. R. (2009). Medial temporal lobe activity can distinguish between old and new stimuli independently of overt behavioral choice. *Proceedings of the National Academy of Sciences, 106*(34), 14617-14621. https://doi.org/10.1073/pnas.0907624106

10. Toner, C. K., Pirogovsky, E., **Kirwan, C. B**., & Gilbert, P. E. (2009). Visual object pattern separation deficits in nondemented older adults. *Learning and Memory, 16,* 338-342. https://doi.org/10.1101/lm.1315109

9. **Kirwan, C. B.,** Wixted, J. T., & Squire, L. R., (2008). Activity in the medial temporal lobe predicts memory strength, whereas activity in the prefrontal cortex predicts recollection. *Journal of Neuroscience, 28*(42), 10541-10548. https://doi.org/10.1523/JNEUROSCI.3456-08.2008

8. Shrager, Y., **Kirwan, C. B.,** & Squire, L. R. (2008). Activity in both hippocampus and perirhinal cortex predicts the memory strength of subsequently remembered information. *Neuron, 59*(4), 547-553. https://doi.org/10.1016/j.neuron.2008.07.022

7. Shrager, Y., **Kirwan, C. B.,** & Squire, L. R. (2008). The neural basis of the cognitive map: path integration does not require hippocampus or entorhinal cortex. *Proceedings of the National Academy of Sciences*, *105*(33), 12034-12038. https://doi.org/10.1073/pnas.0805414105

6. Bakker, A., **Kirwan, C. B.,** Miller, M. I., & Stark, C. E. L. (2008). Pattern separation in the human hippocampal CA3 and dentate gyrus subfields. *Science, 319*(5870), 1640-1642. https://doi.org/10.1126/science.1152882

5. **Kirwan, C. B.,** Galvan, V. V., Bayley, P. B., & Squire, L. R. (2008). Detailed recollection of remote autobiographical memory after damage to the medial temporal lobe. *Proceedings of the National Academy of Sciences*, *105*(7), 2676-2680. https://doi.org/10.1073/pnas.0712155105

4. **Kirwan, C. B.,** Jones, C. K., Miller, M. I., & Stark, C. E. L. (2007). High-resolution fMRI investigation of the medial temporal lobe. *Human Brain Mapping, 28*(10), 959-966. https://doi.org/10.1002/hbm.20331

3. **Kirwan, C. B.,** & Stark, C. E. L. (2007). Overcoming interference: An fMRI investigation of pattern separation in the medial temporal lobe. *Learning and Memory*, *14*(9), 625-633. https://doi.org/10.1101/lm.663507

2. **Kirwan, C. B.,** Gilbert, P. E., & Kesner, R. P. (2005). The role of the hippocampus in spatial location retrieval. *Neurobiology of Learning and Memory, 83*(1), 65-71. https://doi.org/10.1016/j.nlm.2004.08.001

1. **Kirwan, C. B.,** & Stark, C. E. L. (2004). Medial temporal lobe activation during encoding and retrieval of novel face-name pairs. *Hippocampus, 14*(7), 919-930. https://doi.org/10.1002/hipo.20014

BOOK CHAPTERS

Kirwan, C. B., & Bodily, T. (2017). Network connectivity. In J. Kreutzer, J. DeLuca & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 1-2). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-56782-2_9070-1

Kirwan, C. B., & Bodily, T. (2017). Network edges. In J. Kreutzer, J. DeLuca & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 1-2). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-56782-2_9071-1

Kirwan, C. B., & Bodily, T. (2017). Network hubs. In J. Kreutzer, J. DeLuca & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 1-2). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-56782-2_9073-1

Kirwan, C. B., & Bodily, T. (2017). Network nodes. In J. Kreutzer, J. DeLuca & B. Caplan (Eds.), *Encyclopedia of Clinical Neuropsychology* (pp. 1-2). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-56782-2_9072-1

Kirwan, C. B. (2016). Cognitive neuroscience. In H. L. Miller (Ed.), *The SAGE Encyclopedia of Theory in Psychology*. SAGE Publications.

Kirwan, C. B. & Nash, M. I.* (2015) Resolving interference: The role of the human hippocampus in pattern separation. In P. A. Jackson, A. A. Chiba, R. F. Berman, & M. E. Ragozzino (Eds.), *The neurobiological basis of memory: A system, attribute, and process analysis (a festschrift in honor of Raymond P. Kesner)*. Springer.

INVITED PRESENTATIONS

Kirwan, C. B. (2018, May). Encoding, Retrieval, and Consolidation Effects on Hippocampal-Dependent Memory Discrimination. Invited presentation at the Hippocampal Networks across the Lifespan, Budapest, Hungary

Kirwan, C. B. (2017, July). Does the Brain Really Work That Way?: Commonly Held Misconceptions about the Brain and What You Can Do about Them. Invited presentation at Education Weekend Oxford 2017, Oxford, UK

Kirwan, C. B. (2016, December). Memory Specificity in the Hippocampus. Invited presentation at the Hungarian Academy of Sciences (Magyar Tudományos Akadémia)

Kirwan, C. B. (2016, July). Pattern separation in aging and disease states. Invited symposium presented at the International Conference on Memory, Budapest, Hungary

Kirwan, C. B. (2016, July). Should you trust your eyes? How the brain forms perceptions in an uncertain world. Invited presentation at Education Weekend Oxford 2016, Oxford, UK

Kirwan, C. B. (2015, July). Your memory is better (and worse) than you think it is: What neuroimaging tells us about the mind. Invited presentation at Education Weekend Oxford 2015, Oxford, UK

Kirwan, C. B. (2014, April). The hippocampus and memory discrimination. Invited Keynote presentation at the 16th Annual Graduate Student Research Symposium, University of Wisconsin, Milwaukee

Kirwan, C. B. (2012, September). Pattern Separation Processes in the Medial Temporal Lobe. Invited presentation at the Center for Imaging of Neurodegenerative Diseases, UCSF, San Francisco, CA

Kirwan, C. B. (2012, February). Pattern Separation Processes in the Hippocampus: Evidence from Amnesia. Invited symposium presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, Canada

Kirwan, C. B. (2010, January). Intact Detailed Remote Episodic Memory Following Hippocampal Damage in Humans. Invited symposium presentation at the 34th Annual Conference on the Neurobiology of Learning and Memory, Park City, Utah

ABSTRACTS AND CONFERENCE PRESENTATIONS (last 5 years)

Kirwan, C. B., Anderson, B., Eargle, D., Jenkins, J., and Vance, A. Attentional habituation to non-essential computer notifications generalizes to security warnings: an fMRI study. Program No. 665.06. Neuroscience 2019 Abstracts. Washington, DC: Society for Neuroscience, 2019. Online.

Anderson, B., **Kirwan, C. B.**, Eargle, D., Jenkins, J., Vance, A., "Neural evidence of generalization of software notifications to security warnings," Security and Human Behavior Workshop, Harvard University, June 2019

Kirwan, C. B., Anderson, B., Eargle, D., Jenkins, J., and Vance, A. Using fMRI to measure stimulus generalization of software notification to security warnings. Retreat on NeuroIS, Vienna, Austria, June 2019

Maxwell, E. R.**, Allen, W. D., Bjornn, D. K.*, Muncy, N. M.*, Larson, M. J., & **Kirwan, C. B.** The effects of target-lure similarity to false alarms on memory specificity: An fMRI study. Poster presented at the Cognitive Neuroscience Society 26th Annual Meeting, San Francisco, CA, March 2019

Muncy, N. M.* and **Kirwan, C. B.** Memory of time: A novel paradigm to assess mnemonic discrimination for event duration. Program No. 248.23. Neuroscience 2018 Abstracts. San Diego, CA: Society for Neuroscience, 2018. Online.

Giraud-Carrier, L.**, Bjornn, D. K.*, Towne, C.** and **Kirwan, C. B.** Auditory and visual mnemonic discrimination are correlated in healthy young adults. Program No 693.12. Neuroscience 2018 Abstracts. San Diego, CA: Society for Neuroscience, 2018. Online.

Hobbs, L. K., Stevens, N. M., Richter, K., Anderson, M. L.*, Johnson, P., Muncy, N. M.*, Doxey, C. R.*, Wang, H., Hartley, R., Davis, K., Ottesen, **Kirwan, C. B.**, and Wisco, J. Putative pheromone activated brain activity between male and female young adults. Program No. 55.01. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Bodily, T. A.*, Peacock, J., Busath, D., and **Kirwan, C. B.** An fMRI analysis of peripheral neuropathy pain before and after treatment with transcutaneous electrical nerve stimulation. Program No. 398.15. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Bjornn, D. K.*, Straw, C.**, Brighton, E. S.**, and **Kirwan, C. B.** Target-lure similarity predicts eye movements during encoding and retrieval in a mnemonic discrimination task. Program No. 431.17. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Winn, T.**, Hedges-Muncy, A.*, and **Kirwan, C. B.** Mnemonic discrimination in context-dependent memory specificity utilizing eye tracking confidence measures. Program No. 431.18. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Howell, A. L.**, Gold, C. E.*, and **Kirwan, C. B.** Exploring the resting state neural activity of monolinguals, late and early bilinguals. Program No. 431.19. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Hedges-Muncy, A.*, Muncy, N. M.*, and **Kirwan, C. B.** MRI data pre-processing steps differentially affect volumetric measures. Program No. 431.20. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Muncy, N. M.*, and **Kirwan, C. B.** The fate of memory representations in mnemonic generalization: An FMRI study. Program No. 431.21. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Hodges, C. B.*, Muncy, N. M.*, and **Kirwan, C. B.** Physical activity is associated with differential BOLD responses in the hippocampus during pattern separation: an fMRI study. Program No. 431.22. Neuroscience 2017 Abstracts. Washington, DC: Society for Neuroscience, 2017. Online.

Kirwan, C. B., Vance, A., Jenkins, J., Anderson, B. B., Bjornn, D. K.* Why and how to design behavioral experiments to complement decision neuroscience experiments. Talk presented at the 7th Annual Interdisciplinary Symposium on Decision Neuroscience, Stanford University, Palo Alto, CA, June 2017

Kaseda, E., Birmingham, W. A., **Kirwan, C. B.**, Nielson, S., Anderson, M. L.*, Blackhurst, Z., Aaron, S., & Braithwaite, S. R. (2017, March) Emotional processing in supportive marriages: Increased amygdala activation in an FMRI investigation. Presented at the American Psychosomatic Society Meeting, Seville, Spain.

Anderson, B., Jenkins, J., Vance, A., **Kirwan, C. B.**, & Bjornn, D.* It all looks the same to me: security warning and system notification generalization captured through eye tracking, Workshop on Information Security and Privacy (WISP), Dublin, Ireland, December 2016

Hedges-Muncy, A.*, & **Kirwan, C. B.** The influence of context elements on pattern separation. Program No. 637.18. Neuroscience 2016 Abstracts. San Diego, CA: Society for Neuroscience, 2016. Online.

Muncy, N. M.* & **Kirwan, C. B.** The effect of false recognition on memory encoding and discrimination.

Program No. 637.14. Neuroscience 2016 Abstracts. San Diego, CA: Society for Neuroscience, 2016. Online.

Bjornn, D. K.*, Howell, A. L.**, Anderson, B. B., Vance, A., & **Kirwan, C. B.** Evidence for consolidation of pattern-separated memories in ventromedial prefrontal cortex but not hippocampus. Program No. 637.13. Neuroscience 2016 Abstracts. San Diego, CA: Society for Neuroscience, 2016. Online.

Sandberg, D**, Gale, S. D., & **Kirwan, C. B.** Priming facilitates pattern separation processes. Program No. 637.12. Neuroscience 2016 Abstracts. San Diego, CA: Society for Neuroscience, 2016. Online.

Anderson, B., Vance, A., Jenkins, J., **Kirwan, C. B.**, & Bjornn, D.* I can't spot the difference: An eye tracking study examining generalization between security warnings and system notifications, The Dewald Roode Workshop on Information Systems Security Research, IFIP WG8.11/WG11.13, Albuquerque, NM, October 2016

Bjornn, D. K.*, **Kirwan, C. B.**, Anderson, B. B., Jenkins, J. L., & Vance, A. A longitudinal investigation of habituation to security warnings: A parallel fMRI and eye tracking study. Presented at the 6th Annual Interdisciplinary Symposium on Decision Neuroscience, Philadelphia, PA, June 2016

Anderson, B., Vance, A., Jenkins, J., **Kirwan, C. B.**, & Bjornn, D.* It all blurs together: How the effects of habituation generalize across system notifications and security warnings, Gmunden Retreat on NeuroIS, Gmunden, Austria, June 2016

Vance, A., Anderson, B., Jenkins, J., **Kirwan, C. B**., & Bjornn, D.* It all blurs together: How the effects of habituation generalize across system notifications and security warnings, Lightning Talk, Symposium on Usable Privacy and Security, Denver, CO, June 2016

Jenkins, J., Anderson, B., Vance, A., **Kirwan, C. B**., & Eargle, D. More harm than good? How security messages that interrupt make us vulnerable, Workshop on Security and Human Behavior, Boston, MA, May 2016

Vance, A., Anderson, B., Jenkins, J., **Kirwan, C. B**., & Bjornn, D.* It all blurs together: How the effects of habituation generalize across system notifications and security warnings, Workshop on Security and Human Behavior, Boston, MA, May 2016

Kirwan, C. B. & Anderson, M. L.* What is the effect of reward on pattern separation? Presented at the 40th Annual Conference on the Neurobiology of Learning and Memory, Park City, UT, January 2016

GRANTS

Extramural Awards:

The Blurring of Non-essential Notifications and Critical Security Warnings: Examining the Problem of Generalization in the Brain 2018-2019

Role: Co-Investigator

Co-investigators: Anthony Vance (PI; Temple University), Bonnie Anderson (BYU Information Systems)

Source: National Science Foundation

Award: $151,823 ($101,215 total direct costs)

Using Brain Mapping to Distinguish and Predict Successful and Unsuccessful Cognitive Aging 2018
Role: Principal Investigator
Source: Fulbright Research Grant (US State Department)
Host: Hungarian Academy of Sciences, Research Center for Natural Sciences
Award: $12,900 plus HUF 520,000 ($2,023)

Using Brain Mapping to Distinguish and Predict Successful and Unsuccessful Cognitive Aging 2018
Role: Principal Investigator
Source: Hungarian Academy of Sciences (Magyar Tudományos Akadémia), MTA Mobility Grant (Supplement to Fulbright Research Grant)
Award: HUF 1,000,000 ($3,891)

Improving Adherence to Security Messages through Intelligent Timing: A Neurosecurity Study 2016
Role: Co-Investigator
Co-investigators: Anthony Vance (PI; BYU Information Systems), Bonnie Anderson (BYU Information Systems)
Source: Google Inc.
Award: $37,700

The Force of Habit: Using fMRI to Explain Users' Habituation to Security Warnings (Supplement) 2016
Role: Co-Investigator
Co-investigators: Bonnie Anderson (PI; BYU Information Systems), Anthony Vance (BYU Information Systems)
Source: National Science Foundation
Award: $58,185

Has Your Warning Turned into Wallpaper? Using Neuroscience to Design Habituation-Resistant Security Messages 2015
Role: Co-Investigator
Co-investigators: Anthony Vance (PI; BYU Information Systems), Bonnie Anderson (BYU Information Systems)
Source: Google Inc.
Award: $35,503

The Force of Habit: Using fMRI to Explain Users' Habituation to Security Warnings 2014-2016
Role: Co-Investigator

Co-investigators: Bonnie Anderson (PI; BYU Information Systems), Anthony Vance (BYU Information Systems)
Source: National Science Foundation
Award: $294,341 ($196,227 Total direct costs)

Memory Processes in the Medial Temporal Lobe 2010-2011
Role: Principal Investigator
Source: The Brain Institute at the University of Utah Pilot Program in Imaging Research
Award: $5,000

Intramural Awards:

Using Functional Neuroimaging to Address the Replication Crisis in Cognitive Neuroscience 2020-2021
Role: Principal Investigator
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $20,000

Saving Memories from the Bottomless Abyss of Oblivion: A Neurobiological Investigation of Memory Encoding and Retrieval 2018-2019
Role: Principal Investigator
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $20,000

A Graph Theoretical Analysis of Functional Brain Networks in Healthy Aging and Memory 2017
Role: Principal Investigator
Source: BYU Gerontology Program
Award: $9,950

The Neurobiological Basis of Memory Specificity: The Influence of Context and Re-Encoding 2016-2017
Role: Principal Investigator
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $20,000

Memory for Real-World Computer Stimuli: The Effects of Stimulus Repetition Frequency and Dishabituation 2016-2017
Role: Principal Investigator
Source: BYU College of Family Home and Social Sciences Research Grant
Award: $6,000

The Influence of Declarative Memory on Decision Making: Recognition Confidence 2015-2016
Role: Principal Investigator
Source: BYU MRI Research Facility Seed Research Grant
Award: $10,000

Using a Novel High-Resolution fMRI Technique to Investigate Differential Responses in the Brain to Objects and Locations 2015-2016
Role: Principal Investigator
Source: BYU College of Family Home and Social Sciences Research Grant
Award: $6,400

Emotional Regulation in Marital Therapy 2015-2016
Role: Co-Investigator
Co-investigators: Angela Bradford (PI; BYU Family Life), Lee Johnson (PI; BYU Family Life), Rick Miller (BYU Family Life)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $19,975

Effects of Sleep Duration on Neural Responses to Food Stimuli in Adolescents 2015-2016
Role: Co-Investigator
Co-investigators: Chad Jensen (PI; BYU Psychology)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $19,910

Emotional Regulation in Marital Therapy: Understanding the Process of Change 2014-2015
Role: Co-Investigator
Co-investigators: Lee Johnson (PI; BYU Family Life), Rick Miller (BYU Family Life), Angela Bradford (BYU Family Life)
Source: BYU, Marjorie Pay Hinckley Research Award
Award: $22,400

The Impacts of Physical Activity on Memory Specificity 2014
Role: Principal Investigator
Source: BYU, Department of Psychology, McCartney Scholarship
Award: $2,000

Exploring the impact of exercise and context on memory specificity 2014-2015
Role: Principal Investigator/Faculty Mentor
Source: BYU Graduate Mentoring Award (Student Awardee: Michelle Nash)

Award: $15,000

Hippocampal Volume, Aging, and Memory Processes 2014-2015
Role: Principal Investigator
Source: BYU Gerontology Program
Award: $9,975

Impact of Heart Rate Variability Biofeedback on fMRI Measures of Cognitive Functioning in Depressed and non-Depressed Individuals 2014-2015
Role: Co-Investigator
Co-investigators: Patrick Steffen (PI; BYU Psychology)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $18,300

Your Memory is Working Against You: Using fMRI to Explain How Memory Affects Susceptibility to Phishing 2014-2015
Role: Co-Investigator
Co-investigators: Bonnie Anderson (PI; BYU Information Systems), Anthony Vance (BYU Information Systems)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $19,527

Does a Context of Gains or Losses Influence Memory Specificity? 2013-2014
Role: Principal Investigator
Source: BYU College of Family Home and Social Sciences Research Grant
Award: $6,160

The Neural Correlates of Anxiety, Learning and Memory in Autism 2013-2014
Role: Principal Investigator
Co-investigator: Mikle South (BYU Psychology)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $20,000

Development of Student Research Resources and Training Material for Functional and Structural MRI-Based Research at BYU 2013-2014
Role: Co-Investigator
Co-investigators: Neal Bangerter (PI; BYU Electrical Engineering), Erin Bigler (BYU Psychology)
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)

Award: $20,000

Hippocampal Volume, Aging, and Memory Processes 2011-2012
Role: Principal Investigator
Source: BYU Gerontology Program
Award: $9,985

The Cognitive Neuroscience of Long-Term Memory 2011-2012
Role: Principal Investigator
Source: BYU Office of Creative and Research Activities Faculty Mentoring Environment Grant (MEG)
Award: $20,000

Associative Memory in the Medial Temporal Lobe 2011-2012
Role: Principal Investigator
Source: BYU College of Family Home and Social Sciences Research Grant
Award: $6,160

Aging and Pattern Separation Processes in the Human Hippocampus 2010-2011
Role: Principal Investigator
Source: BYU College of Family Home and Social Sciences Research Grant
Award: $6,440

Cognitive and Neural Aspects of Memory Confidence 2010-2011
Role: Principal Investigator/Faculty Mentor
Source: BYU Graduate Mentoring Award (Student Awardee: Jeremy Roper)
Award: $4,000

AWARDS AND HONORS

Information Systems Research Paper of the Year: 2017
Jenkins, Anderson, Vance, **Kirwan,** & Eargle (2016). More Harm than Good? How Messages that Interrupt Can Make Us Vulnerable. *Information Systems Research*. 27(4):880-896.

Institutional National Research Service Award, Institute for Neural Computation Training Grant, University of California, San Diego 2006-2008

National Science Foundation Graduate Research Fellowship Honorable Mention 2004

Faculty for Undergraduate Neuroscience Travel Award 2001

National Science Foundation Research for Undergraduate Education (RUE) supplemental award 2000

National Merit Scholar, University of Utah 1995-2000

MENTORING EXPERIENCE

PhD Dissertation Committee Chair:

James, Jesse	Psychology		2014
Nash, Michelle	Psychology		2015
Anderson, Malia	Neuroscience		2016
Doxey, Christopher	Neuroscience		2016
Bjornn, Daniel	Psychology		2018
Hedges-Muncy, Ariana	Psychology		2020
Muncy, Nathan	Psychology		2020
Cooper Hodges	Psychology		2020

Masters Thesis Committee Chair:

Roper, Jeremy	Psychology		2011
Motley, Sarah	Neuroscience		2012
Shelton, DJ	Psychology		2013
Muncy, Nathan	Neuroscience		2016
Bodily, Ty	Neuroscience		2018
Michelle Deursch	Neuroscience		2020

Undergraduate Senior Capstone Research:

Ashby, Stefania	Psychology		2011
Henderson, Mark	Psychology		2011

PhD Dissertation Committee Service:

Tsui, Yoko	Clinical Psychology	(Chair: Steffen)	2015
Flores, Diego	Psychology	(Miller)	2016
Friend, Lindsay	Neuroscience	(Edwards)	2016
Berrett, Andrew	Psychology	(Gale)	2017
Hunt, Isaac	Clinical Psychology	(Larson)	2017
Miller, Roxanne	Neuroscience	(Edwards)	2017
Duraccio, Kara	Clinical Psychology	(Jensen)	2018
Steed, Kevin	Neuroscience	(Wisco)	2018
Wright, Kacie	Psychology	(Hopkins)	2018
Barnett, Kimberly	Clinical Psychology	(Jensen)	
Carbine, Kaylie	Clinical Psychology	(Larson)	2020
Carter, Ben	Neuroscience	(Luke)	
Johnson, Paula	Neuroscience	(Charles)	2019

Masters Thesis Committee Service:

Badgley, Corinne	Neuroscience	(Chair: Edwards)	2012
Masterson, Travis	Exercise Science	(LeCheminant)	2015
Hyatt, Elizabeth	Comm. Disorders	(McPherson)	2015
DeVries, Tiffany	Exercise Science	(LeCheminant)	2016
Moizer, Caitlyn	Comm. Disorders	(McPherson)	2016
Gold, Carrie	Spanish Pedagogy	(Thompson)	2017
White, Mary	Exercise Science	(Bailey)	2018
Sorenson, David	Neuroscience	(McPherson)	2018
Jorgenson, Benjamin	Spanish Pedagogy	(Thompson)	2020

COURSES TAUGHT

Brigham Young University

- IAS 201R: Cultural Survey-Europe
- IS 201: Introduction to Management Information Systems
- NEURO 380: Behavioral Neuroscience
- NEURO 601: Graduate Neuroscience
- PSYCH 301: Psychological Statistics
- PSYCH 370: Sensation and Perception
- PSYCH 375: Cognition
- PSYCH 381: Behavioral Neurobiology
- PSYCH 377: Cognitive Neuroscience of Memory
- PSYCH 514: Computational Neuroimaging Analysis
- PSYCH 517: Neuroimaging Analysis 3: fMRI
- PSYCH 605R: Professional Seminar in Psychology

San Diego State University

- PSYCH 380: Cognitive Psychology
- PSYCH 270: Statistical Methods in Psychology

Johns Hopkins University

- 200.173: Brain Myths: Neuroscience in Popular Culture and the Media
- 200.114: Laboratory in the Analysis of Psychological Data

PROFESSIONAL AFFILIATIONS

Cognitive Neuroscience Society	2003-present
Faculty for Undergraduate Neuroscience	2015-present
Society for Neuroscience	2003-present
Association for Information Systems	2014-present

UNIVERSITY & COMMUNITY SERVICE

Academic Service Activities:

BYU MRI Research Facility Director	2016-present
BYU MRI Research Facility Associate Director	2013-2015
Psychology Dept. Rank and Status Committee (Chair)	2015-present
College of Family Home & Social Sciences Space Committee	2016-present
Neuroscience Center Endowment Committee (Chair)	2016-present
Psychology Dept. Graduate Curriculum Committee (Chair)	2010-present
College of Family Home & Social Sciences Research Committee	2010-2013
Psychology Dept. Graduate Admissions Committee	2009-2013
Psychology Dept. Learning Outcomes & Assessment Committee	2010-2011
Psychology Dept. Undergraduate Journal Peer Reviewer	2009-2010
UCSD fMRI Users Group Meeting Organizing Committee	2007-2008
Organizer, Institute for Neural Computation Fellows' Colloquium, UCSD	2007-2008

Community Activities:

BYU MBA Spouse Association Presentation	Dec. 2016
Utah Natural History Museum Science Movie Night; Salt Lake City, UT	Oct. 2012
Brain Awareness Week Presentation; Timpview High School, Provo, UT	April 2010
Judge, Central Utah Science & Engineering Fair	Mar. 2010
Moderator, Student Research Symposium, San Diego State University	Feb. 2009
Brain Awareness Week Presentation; Show Low High School, Show Low, AZ	2007
Brain Awareness Week Presentation; Baltimore Polytechnic High School, Baltimore, MD	2004-2006
Department Representative to the Graduate Representative Organization, Johns Hopkins University	2003-2004
Volunteer Assistant to the Hungarian National Olympic Committee at the 2002 Salt Lake Winter Olympic Games	Feb. 2002

PROFESSIONAL SERVICE

Journal Editorial Board Member:

Behavioral Neuroscience	2015-present

Professional Leadership:

President, Intermountain Chapter of the Society for Neuroscience	2015-2018

Grant Proposal Ad-hoc Reviewer:

United States-Israel Binational Science Foundation	Feb. 2018
UK Medical Research Council	Aug. 2017
German-Israeli Foundation for Scientific Research and Development	Jan. 2018, Jan. 2017, Jan. 2016, Jan. 2015, March 2013
National Science Foundation International Research Fellowship Program	Jan. 2012

Scientific Conference Organizer:

NeuroIS Retreat, Organizing Committee	June 2018 June 2019
Annual Winter Conference on the Neurobiology of Learning and Memory Executive Committee	2015–present
39th Annual Winter Conference on the Neurobiology of Learning and Memory Scientific Program Committee	Jan. 2015
43rd Annual Meeting of the International Neuropsychological Society Scientific Program Committee	Feb. 2015

Professional External Review

Review of Candidate for Assistant Project Scientist Position, UC San Diego	Oct. 2016

Ad-hoc Journal Reviewer:

- Behavioral Neuroscience
- Behavioral Brain Research
- Brain
- Brain Imaging and Behavior
- Brain Research
- Cell Reports
- Cerebral Cortex
- Cognitive Neuroscience
- Current Biology
- eLife
- European Journal of Neuroscience
- Frontiers in Neuroscience
- Hippocampus
- Human Brain Mapping
- Information Systems Research
- International Journal of Psychophysiology
- Journal of Gerontology: Psychological Science
- Journal of Neuroscience
- Learning & Memory
- Management Information Systems Quarterly
- Neurobiology of Aging
- Neurobiology of Learning and Memory
- NeuroImage
- Neuron
- Neuropsychologia
- Neuropsychology
- Neuroscience and Biobehavioral Reviews
- Neuroscience Letters
- PLOS ONE
- Proceedings of the National Academy of Sciences
- Schizophrenia Research
- Scientific Reports
- Social Cognition