Curriculum Vitae

Aaron T. Buss

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Educational and Professional History

Academic Positions

2020 –	Associate Professor University of Tennessee – Knoxville, Department of Psychology
2014 – 2020	Assistant Professor University of Tennessee – Knoxville, Department of Psychology
Spring 2014	Lecturer University of Iowa, Department of Psychology

Education

2013	Ph.D., University of Iowa Psychology, Developmental Science training area Thesis title: "Closing the developmental loop on the neurocognitive dynamics of task switching" Advisor: John P. Spencer
2007	B.S., North Central College Psychology *cum laude*, 2007 Honors Thesis title: "Applying a dynamic systems perspective to the Dimensional Change Card Sort (DCCS) task" Advisor: Lisa C. Whitfield

Research Positions

2007 – 2013	Graduate Research Assistant, Spatial Perception, Action, and Memory Laboratory Supervisor: John P. Spencer, Ph.D.

Research Interests

Executive function, cognitive development, cognitive neuroscience, computational neuroscience

Honors and Awards

2021	Early Career Research Award, College of Arts & Sciences, University of Tennessee
2014	University of Iowa, D. C. Spriestersbach Dissertation Award
2013	University of Iowa, Lewis Award in Experimental Psychology
2011	Delta Center Conference Travel Award
2011	Society for Research in Child Development Conference Travel Award
2009	University of Iowa, J. R. Simon Early Scholarship Potential Award
2008	Cognitive Science Society Conference Travel Award
2007	North Central College, Psychology Department Graduate of the Year
2003 – 2007	North Central College, College Scholar
2003 – 2007	North Central College, Presidential Scholarship

Specialized Research Training

- NIRS-DOT Visiting Fellowship Course at Massachusetts General Hospital/MIT/Harvard Medical School Athinoula A. Martinos Center for Biomedical Imaging
- fMRI Analysis and Bash Programming Course at the University of Iowa, Department of Psychology
- Functional Magnetic Resonance Imaging Course at the University of Iowa, Department of Radiology

Professional Activities

Departmental and University Service

2020-present	Department of Psychology Faculty Review Committee
2020-present	Proxy Member, Graduate Council
2018-present	Executive Committee Member, NeuroNET
2016 – 2018	Executive Committee Member, UTK, Department of Psychology
2016 – present	Faculty Advisor for Neuroscience Major, UTK
2017 – 2018	Faculty Senate Alternate Member, UTK
Fall 2015	Faculty Search Committee Member, Biological Area, UTK, Department of Psychology

Grant reviewing

Dec 2020	NIH, NIH Director's Early Independence Award Mail-in Reviewer
July 2020	Member, NIH Special Emphasis Review Panel
December 2019	Member and Alternate Chair, NIH Special Emphasis Review Panel
August 2019	Reviewer, Agence Nationale de la Recherche
June 2019	Temporary member, NIH Cognition and Perception Review Panel

Journal Editing

August 2019-	Consulting Editor, *Child Development*

Ad hoc reviewer

Brain Sciences, Child Development Perspectives, Cognitive Development, Cognitive Science, Consciousness and Cognition, Cortex, Developmental Cognitive Neuroscience, Developmental Psychobiology, Developmental Psychology, Developmental Science, Frontiers in Psychology, Infant and Child Development, Journal of Experimental Child Psychology, Neuroscience

Conference reviewer

2009, 2015, 2018 Conference of the Cognitive Science Society
2015 IEEE – International Conference on Development and Learning and on Epigenetic Robotics

Memberships in Professional Organizations

NeuroNET, University of Tennessee
Delta Center, University of Iowa
Society for Research in Child Development
Society for Functional Near Infrared Spectroscopy
Cognitive Science Society
Cognitive Development Society

Research

Research Support

Current External Research Support

2018-2023 *The neurocognitive dynamics of learning and executive function*
Agency: National Institutes of Health/National Institute of Child Health and Human Development
Type of Grant: R01
Role: PI
Total Cost: $1,096,275

2019-2024 *Multi-sensory development: New measures and a collaborative database*
Agency: National Institutes of Health/National Institute of Child Health and Human Development
Type of Grant: R01
Role: Subcontractor (PI: Lorraine Bahrick, Florida International University)
Subcontract Amount: $15,100

Completed External Research Support

2020-2021 *Accurate, precise and useful models of the state of the learner*
Agency: New Schools Venture Fund
Type of Grant: Applied research
Role: Consultant (P.I.: R. Prather, University of Maryland)
Subcontract Amount: $57,415

2012-2014 *Integrating Perception and Action in a Neural Field Theory of Response Selection*
Agency: National Institute on Drug Abuse
Type of Grant: R03
Role: Co. I. Period: 9/2012-8/2014
Total Amount: $137,148

Completed Internal Research Support

2021 *Acquisition of portable neuroimaging modules for assessing the impacts of opioid exposure on early brain development*
Office of Research Engagement, University of Tennessee – Knoxville
Type of Grant: Equipment Grant
Role: PI
Total Amount: $35,000

2021 *Examining the neurocognitive dynamics of aging and mild cognitive impairment*
Agency: Alzheimer's Research Initiative Gift Fund
Type of Grant: Seed Fund
Role: Co-PI (Co-PI: R. Fernandez, University of Tennessee, UTMCK)
Amount: $25,000

2019 *Enhancing research in brain-computer interface using wireless EEG and fNIRS monitoring*
Office of Research Engagement, University of Tennessee - Knoxville
Type of Grant: Equipment Grant
Role: Co-I (PI: Xiaopeng Zhao, University of Tennessee)
Total Amount: $14,000

2017 *Acquisition of neuroimaging modules for dementia detection, neurorehabilitation, and neuroprosthetics*
Office of Research Engagement, University of Tennessee - Knoxville
Type of Grant: Equipment Grant
Role: Co-I (PI: Xiaopeng Zhao, University of Tennessee)
Total Amount: $40,000

2017 *Investigating the neural systems involved in dimensional attention*
Office of Research Engagement, University of Tennessee - Knoxville
Type of Grant: fMRI Access Award
Role: PI
Amount Awarded: $5,500

2017 *Integrating eye-movement research with fNIRS*
Department of Psychology, University of Tennessee – Knoxville
Type of Grant: Faculty Research Support
Role: Co-PI Period: 9/2017-5/2018
Total Amount: $3,000

2017 *Imaging the Neural Systems Involved in Executive Function*
Department of Psychology, University of Tennessee – Knoxville
Type of Grant: Faculty Research Support
Role: PI Period: 9/2017-5/2018
Total Amount: $900

2016 *A hybrid NIRS-EEG brain computer interface for real-time neurorehabilitation.*
NeuroNET
Type of Grant: Seed grant
Role: Co.I. Period: 8/2016-7/2017

Total Amount: $30,000

Pending External Support

None

Not Funded

2020 *Examining the neurocognitive dynamics of aging and mild cognitive impairment*
Agency: National Institutes of Aging
Type of Grant: R01
Role: P.I.
Amount requested: $2,702,602

2020 *Examining trajectories of neurocognitive function and school-readiness among infants diagnosed with Neonatal Abstinence Syndrome*
Agency: National Institutes of Drug Abuse
Type of Grant: R01
Role: P.I.
Amount requested: $1,818,378

2020 *Impact of background noise on auditory processing in stuttering and non-stuttering populations*
Agency: National Institute of Deafness and Communication Disorders
Type of Grant: R21
Role: Co-Investigator (PI: Saltuklaroglu)
Amount requested: $250,000

2019 *MIND Lab: Multisensory neurological decoding for cognitive deficits*
Agency: National Institutes of Mental Health
Type of Grant: R21
Role: Consultant (P.I.: Xiaopeng Zhao, University of Tennessee)
Amount requested: $2,000

2019 *Follow-up of infants with neonatal abstinence syndrome*
Agency: National Institute on Drug Abuse
Type of Grant: R03
Role: Co-PI (PI: Julia Jaekel)
Amount Requested: $151,000

2018 *Neurocognitive development of rural Appalachian children exposed to opioids in-utero*
Agency: National Institutes of Mental Health
Type of Grant: R21
Role: Co-PI (Co-PI: Julia Jeakel)
Amount Requested: $387,349

2018 *Exploring the Dynamics of Neurocognitive Aging*
Agency: National Institutes of Mental Health/National Institute on Aging
Type of Grant: R01

Role: PI (Co-I: Matthew Costello, University of Hartford; David Steffens, Lihong Wang, & Kevin Manning, University of Connecticut Health Center)
Amount Requested: $2,171,870 ($883,806 to UTK)

2017 *A new bottom-up approach to strengthening executive function development*
Agency: National Institutes of Health/National Institute of Child Health and Human Development
Type of Grant: Research
Role: Co-PI (PI: Sammy Perone, Washington State University)
Subcontract Amount Requested: $157,671

2017 *A bottom-up approach to executive function development*
Agency: National Science Foundation
Type of Grant: Research
Role: Co-PI (PI: Sammy Perone, Washington State)
Amount Requested: $85,168

2017 *Neural noise as a mechanism of cross-modal receptive communication impairment in autism spectrum disorders: A developmental study*
Agency: National Institutes of Health/National Institute of Deafness and Other Communication Disorders
Type of Grant: R21
Role: Consultant (PI: Laura Morett, University of Alabama)
Amount Requested: $15,000

Publications

Peer-Reviewed Journal Articles

[±]student co-authors

Defenderfer, J. D.[±], Hedrick, M., Plyler, P., Wijeakumar, S., & **Buss, A. T.** (2021). Examining the hemodynamic response during perception of noise-vocoded speech and speech in background noise: An image-based fNIRS study. *NeuroImage, 240,* 118385.

Liu, Z., Shore, J., Wang, M., Yuan, F., **Buss, A. T.**, & Zhao, X. (2021). A systematic review on hybrid EEG/fNIRS in brain-computer interface. *Biomedical Signal Processing and Control, 68,* 102595.

Buss, A. T., Magnotta, V., Hazeltine, E., Kinder, K.[±], & Spencer, J. P. (2021). Probing the neural systems underlying flexible attention. *Journal of Cognitive Neuroscience, 33(7)*, 1365-1380.

Kinder, K. T.[±] & **Buss, A. T.** (2021). The role of action on memory: Testing an action-induced encoding account. *Memory & Cognition, 49*, 586-599.

Buss, A. T., Magnotta, V., Schöner, G., Huppert, T. J., Penny, W., & Spencer, J. P. (2021). How do neural processes give rise to cognition? Simultaneously predicting brain and behavior with a dynamic model of visual working memory. *Psychological Review, 128*(*2*), 362-395.

Perone, S., Simmering, V. R., & **Buss, A. T.** (2021). A dynamical reconceptualization of executive function development. *Perspectives in Psychological Science,* 1745691620966792.

Kerr-German, A. N.[±] & **Buss, A. T.** (2020). Exploring the neural basis of flexible and selective dimensional attention. *Journal of Cognition and Development, 31*(3), 313-325.

Tas, A. C., Costello, M. C., & **Buss, A. T.** (2020). Age-related declines in visual working memory: The effects of non-target objects during a delayed estimation task. *Psychology & Aging, 35*(4), 565-577.

Buss, A. T. & Nikam, B.[±] (2020). Not all labels develop equally: The role of labels in guiding attention to dimensions. *Cognitive Development, 53,* 100843.

Buss, A. T. & Kerr-German, A. N.[±] (2019). Dimensional attention as a mechanism of executive function development: Integrating flexibility, selectivity, and stability. *Cognition, 192,* 104003.

Buss, A. T., Ross-Sheehy, S., & Reynolds, G. (2018). Visual working memory in early development: A development cognitive neuroscience perspective. *Journal of Neurophysiology, 120,* 1472-1483.

Costello, M. C. & **Buss, A. T.** (2018). Age-related decline in visual working memory: Behavioral results simulated with a dynamic neural field model. *Journal of Cognitive Neuroscience, 30*(10), 1532-1548.

Buss, A. T. & Spencer, J. P. (2018). Changes in frontal and posterior cortical activity underlie the early emergence of executive function. *Developmental Science, 21*(4), e12602.

Defenderfer, J.[±], Kerr-German, A.[±], Hedrick, M., & **Buss, A. T.** (2017) Investigating the role of temporal lobe activation in speech perception accuracy with normal hearing adults: An event-related design. *Neuropsychologia, 106*, 31-41.

Wifall, T., **Buss, A. T.**, Spencer, J. P., Farmer, T., & Hazeltine, E. (2017). Reaching into response selection: Stimulus and response similarity influence central operations. *Journal of Experimental Psychology: Human Perception and Performance, 43*(3), 555-568.

Wijeakumar, S. Huppert, T. J., Magnotta, V., **Buss, A. T.**, & Spencer, J. P. (2017). Validating an image-based fNIRS approach with fMRI and a working memory task. *NeuroImage, 147*(15), 204-218.

Ambrose, J., Wijeakumar, S., **Buss, A. T.**, & Spencer, J. P. (2016). Feature-based change detection reveals inconsistent individual differences in working memory capacity. *Frontiers in Systems Neuroscience 10*(33).

Wijeakumar, S., Magnotta, V., **Buss, A. T.**, Ambrose, J., Wifall, T., Hazeltine, E., & Spencer, J. P. (2015). Response control networks are selectively modulated by attention to rare events and memory load regardless of the need for inhibition. *NeuroImage, 120*(5), 331-344.

Perone, S., Molitor, S., **Buss, A. T.**, Spencer, J. P., & Samuelson, L. K. (2015). Enhancing the executive functions of 3-year-olds in the dimensional change card sort task. *Child Development, 86*(3), 812-827.

Buss, A. T. & Spencer, J. P. (2014). The emergent executive: A dynamic field theory of the development of executive function. *Monographs of the Society for Research in Child Development, 79(2).*

Buss, A. T., Wifall, T., Hazeltine, E., & Spencer, J. P. (2014). Integrating the behavioral and neural dynamics of response selection in a dual-task paradigm: A dynamic neural field model of Dux et al. (2009). *Journal of Cognitive Neuroscience, 26*, 334-351.

Buss, A. T., Fox, N., Boas, D. A., & Spencer, J. P. (2014). Probing the early development of visual working memory capacity with functional near-infrared spectroscopy. *NeuroImage, 85*, 314-325.

Johnson, J. S., Simmering, V. R., & **Buss, A. T.** (2014). Beyond slots and resources? Grounding cognitive concepts in neural dynamics. *Attention, Perception, and Psychophysics*, 76, 1630-1654.

Buss, A. T. & Spencer, J. P. (2012). When seeing is knowing: Visual cues and the dissociation between children's rule-knowledge and rule-use. *Journal of Experimental Child Psychology, 111*, 561-569.

Spencer, J. P., Perone, S., & **Buss, A. T.** (2011). Twenty years and going strong: a dynamics systems revolution in motor and cognitive development. *Child Development Perspectives. 5(4)*, 260-266.

Spencer, J. P. & **Buss, A. T.** (2011). Finding a way out: Why developmental science does not need another "ism". *Child Development Perspectives, 5(3)*, 166-168.

Book Chapters

Buss, A. T. (2021). Executive functioning and inhibitory control. In A. Epperson, *The Encyclopedia of Child and Adolescent Health, 1st edition.* Elsevier: Oxford.

Buss, A. T. & Lowery, K.± (2020). Inhibitory control and executive function. In J. B. Benson (Ed.), *Encyclopedia of Infant and Early Childhood Development, 2nd edition, vol. 2*. Elsevier: Oxford, (pp. 183-193).

Buss, A. T. (2017). Computational models of executive function development. In S. Wiebe and J. Karbach (Eds.), *Frontiers in Developmental Science: Lifespan Development and Plasticity of Executive Function.* Taylor & Francis: New York, NY, (pp. 124-144).

Buss, A. T., Wifall, T. & Hazeltine, E. (2016). The emergence of higher-level cognitive flexibility: Dynamic field theory and executive function. In J. P. Spencer and G. S. Schöner (Eds.), *Dynamic Thinking—A Primer on Dynamic Field Theory.* Oxford University Press: New York, NY, (pp. 327-352).

Buss, A. T. & Spencer, J. P. (2015). Rule-representation. In *Brain Mapping: An Encyclopedic Reference, vol. 1*. Elsevier: Oxford, (pp. 337-342).

Spencer, J. P. & **Buss, A. T.** (2013). The emerging executive: Using dynamic neural fields to understand the development of cognitive control. In P. D. Zelazo & M. Sera (Eds.), *The Minnesota Symposium on Child Psychology: Developing Cognitive Control Processes: Mechanisms, Implications, and Interventions, Volume 37*. John Wiley & Sons, Inc.: Hoboken, NJ, (pp. 91-142).

Manuscripts under Revision

Delgado Reyes, L. M., Spencer, J. P., & **Buss, A. T.** Development of the neural mechanisms of same-different judgements in preschoolers. *Neuroscience.*

Manuscripts under Review

Kerr-German, A., Namuth, A., Santosa, H., **Buss, A. T.**, & White, S. *To snack or not to snack: Using fNIRS to link inhibitory control to functional connectivity in the toddler brain.*

Buss, A. T., Perone, S., Nikam, B.±, & Smith, M.± *Enhancing neural activation of 3-year-olds during an executive function task.*

Kerr-German, A. N.±, Tas, A. C., & **Buss, A. T.** *The relationship between oculomotor and manual measures of attention in 2.5- and 3.5-year-olds.*

Kinder, K. T.±, **Buss, A. T.**, & Tas, A. C. *Tracking flanker task dynamics: Evidence for continuous attentional selectivity.*

Kerr-German, A. N.±, Santosa, H., **Buss, A. T.**, White, S., & Doucet, G. E. *Assessing the relationship between risk for ADHD and functional connectivity in toddlers.*

Manuscripts in Preparation

Ratliff, H.±, Lowery, K.±, Eddings, R.±, Nikam, B.±, Kerr-German, A. N.±, & **Buss, A. T.** *Investigating the neural dynamics of dimensional attention development.*

Lowery, K.±, Eddings, R.±, Kerr-German, A. N., & **Buss, A. T.** *Examining the neural basis of dimensional label learning.*

Lowery, K.±, Nikam, B.±, & **Buss, A. T.** *Learning labels for visual features and dimensions creates neural mechanisms of dimensional attention.*

Buss, A. T. & Visser, I. *Grounding cognitive dynamics in neural dynamics: Applying a hidden Markov model to investigate the latent states of a dynamic neural field model.*

Eddings, R.± & **Buss, A. T.** *Examining the effect of response type on behavioral and neural measures of visual working memory.*

Smith, M.±, Kerr-German, A. N., & **Buss, A. T.** *Frontal-parietal connectivity predicts cognitive flexibility: Comparing typically-developing children with children diagnosed with autism spectrum disorder.*

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Invited Talks

Buss, A. T. (2021, September). Using computational neuroscience to understand the development of executive function. Talk presented at UC Merced. Merced, CA.

Buss, A. T. (2020, March). How learning shapes brain and behavior development. Talk presented at Metropolitan State University. St. Paul, MN.

Buss, A. T. (2019, September). A mechanistic theory of dimensional attention development. Talk presented at the Boys Town National Research Hospital. Omaha, NE.

Buss, A. T. (2018, June). A unified theory of dimensional attention development: Flexibility, selectivity, and stability arise from a common mechanism. Talk presented at Expanding the Field: Multi-Disciplinary Developmental Dynamics. University of East Anglia, Norwich, UK.

Buss, A. T. (2015, February). *Using dynamic field theory to bridge brain and behavior*. Talk presented at the Center for Intelligent Systems and Machine Learning, University of Tennessee.

Buss, A. T. (2015, February). *Shining light on the development of executive function in early childhood.* Talk presented at the Department of Audiology and Speech Pathology, University of Tennessee.

Buss, A. T. (2014, March). *Integrating the behavioral and neural dynamics of task-switching.* Talk presented at the Department of Psychology Brown Bag series, University of Wisconsin.

Spencer, J. P., **Buss, A. T.**, & Magnotta, V. (2013, September). *Testing a dynamic neural field theory of visual working memory with 3 Tesla fMRI and extensions to ultra-high field imaging.* Talk presented at the 7 Tesla Scanner Symposium, Institute for Clinical and Translational Science, University of Iowa.

Spencer, J. P., **Buss, A. T.**, & Magnotta, V. (2013, April). *Testing a dynamic neural field theory of visual working memory using errors in visual thinking and fMRI*. Invited talk at Northwestern University, Evanston, IL.

Spencer, J. P. & **Buss, A. T.** (2012, June). *Taking neuroscience to preschool: Exploring the neural basis of executive function*. Talk presented at the 2012 Get Ready Iowa Workshop, Iowa City, IA.

Spencer, J. P., **Buss, A. T.** & Fox, N. (2012, May). *Probing the development of visual working memory capacity with dynamic neural fields and fNIRS*. Invited talk at the University of Michigan, Ann Arbor, MI.

Buss, A. T. (2012, April). *Exploring the neural basis of executive function in 3- and 4-year-olds.* Neuroimaging Consortium, University of Iowa Hospital, Department of Psychiatry.

Spencer, J. P. & **Buss, A. T.** (2011, October). *The emergent executive: A dynamic neural field theory of the development of cognitive control.* Talk presented at the 37th Minnesota Symposium on Child Psychology, Minneapolis, MN.

Conference Presentations

Conference Symposia Chaired

Buss, A. T. (2018, June). *Current research on executive function development: Brain, behavior, and theory.* Paper symposium presented at the Biennial Meeting of the Jean Piaget Society, Amsterdam, NL.

Buss, A. T. & Spencer, J. P. (2011, July). *Using functional neuroimaging to shed new light on the developing visual brain.* Paper symposium presented at the Annual Meeting of the Cognitive Development Society, Philadelphia, PA.

Buss, A. T. (2011, March). *The development of neural mechanisms of flexible rule-use*. Paper symposium presented at the 69th Biennial Conference of the Society for Research in Child Development, Montreal, CA.

Buss, A. T. (2009, April). *The emergence of executive function in early childhood*. Paper symposium presented at the 68th Biennial Conference of the Society for Research in Child Development, Denver, CO.

Buss, A. T. (2008, July). *Cognitive Development*. Paper symposium presented at the 30th Annual Meeting of the Cognitive Science Society, Washington, D.C.

Workshops

Schöner, G. & **Buss, A. T.** (2020). Building neural processing accounts of higher cognition in Dynamic Field Theory. *Proceedings of the 42nd Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Buss, A. T., Perone, S., & Bhat, A. (2018). Conceptual foundations of dynamic field theory: Applications in cognitive and developmental science. *Proceedings of the 40th Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Conference Proceedings

Kinder, K. ± & **Buss, A. T.** (July, 2018). Coupling perception with action: A dynamic account of the effect of action on memory. *Proceedings of the 40th Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Kerr-German, A. N. ±, Lowery, K. N. ±, & **Buss, A. T.** (July, 2018). Understanding attentional selectivity, flexibility, and stability: A dynamic neural field model predicts behavior in 3- and 4-year-olds. *Proceedings of the 40th Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Lowery, K. N. ±, Kerr-German, A. N. ±, & **Buss, A. T.** (July, 2018). Dimensional label learning predicts the developmental status of executive function. *Proceedings of the 40th Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Buss, A.T. & Spencer, J. P. (2009). Automatic and Voluntary Shifts of Attention in a Dynamic Neural Field Model of the Dimensional Change Card Sort Task. *Proceedings of the 31st Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Buss, A.T. & Spencer, J. P. (2008). The Emergence of Rule-Use: A Dynamic Neural Field Model of the DCCS. *Proceedings of the 30th Annual Conference of the Cognitive Science Society.* Lawrence Erlbaum Associates.

Paper Presentations

Buss, A. T. & Kerr-German, A. N. ± (2019, October). The neural basis of selective and flexible dimensional attention. Paper presented at the 11th Biennial Meeting of the Cognitive Development Society, Louisville, KY.

Buss, A. T. & Kerr-German, A. N. ± (2018, October). A unified theory of dimensional attention development: Integrating implicit and explicit attention. Paper presented at the ICDL Epi-Rob Meeting, Tokyo, JP.

Buss, A. T., Kerr-German, A. N. ±, & Lowery, K. ± (2018, June). A unified theory of dimensional attention in early childhood. In A. T. Buss (Chair), *Current research on executive function development: Brain, behavior, and theory.* Paper presented at the Biennial Meeting of the Jean Piaget Society, Amsterdam, NL.

Buss, A. T. & Kerr-German, A. N. ± (2017, April). Exploring the neural basis of dimensional label learning and dimensional attention with fNIRS. In S. Perone (Chair), *Breaking New Ground: Innovations in the Study of Executive Function Development.* Paper presented at the 72nd Biennial Meeting of the Society for Research in Child Development, Austin, TX.

Spencer, J. P. & **Buss, A. T.** (2016, June). Testing a neural dynamic account of working memory with theory-derived fMRI. Paper presented at the 22nd Annual Meeting of the Organization for Human Brain Mapping, Geneva, Switzerland.

Buss, A. T. & Kerr-German, A. N. ± (2016, June). Exploring the neural basis of dimensional label learning and dimensional attention with fNIRS. In. V. Simmering (Chair), *New Insights from Systems Approaches to Cognition and Development*. Paper presented at the Annual Meeting of the Jean Piaget Society, Chicago, IL.

Buss, A. T. & Spencer, J. P. (2015, April). Shining light on the neural dynamics of flexible rule-use in early childhood. Paper presented at the 71st Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Buss, A. T. & Spencer, J. P. (2013, October). Neural dynamics of cognitive flexibility in early childhood. Paper presented at the Biennial Meeting of the Cognitive Development Society, Memphis, TN.

Buss, A. T. & Spencer, J. P. (2012, October). Integrating behavioral and neural dynamics over development in the Dimensional Change Card Sort (DCCS) task. Paper presented at the Second Biennial fNIRS Conference, London, United Kingdom.

Spencer, J. P., **Buss, A. T.**, Fox, N., & Samuelson, L. (2012, October). Developmental changes in frontal-parietal activation associated with visual working memory capacity. Paper presented at the Second Biennial fNIRS Conference, London, United Kingdom.

Spencer, J. P., **Buss, A. T.**, & Fox, N. (2011, October). Probing the development of visual working memory capacity with Near-Infrared Spectroscopy. In **A. T. Buss** and J. P. Spencer (Chairs), *Using functional neuroimaging to shed new light on the developing visual brain.* Paper presented at the Biennial Meeting of the Cognitive Development Society, Philadelphia, PA.

Spencer, J. P., **Buss, A. T.**, & Magnotta, V. (2011, July). Testing a dynamic neural field model of visual working memory with fMRI. In B. C. Love and J. P. Spencer (Chairs), Moving

beyond where and what to *how*: Using models and fMRI to understand brain-behavior relations. Paper presented at the 33rd Annual Meeting of the Cognitive Science Society, Boston, MA.

Buss, A. T. & Spencer, J. P. (2011, March). The neural basis of flexible rule-use in 3-year-olds. In **A.T. Buss** (Chair), *The development of neural mechanisms of flexible rule use.* Paper presented at the 69th Biennial Meeting of the Society for Research in Child Development, Montreal, Canada.

Spencer, J. P, Austin, A. R., & **Buss, A. T.** (2011, April). Probing the development of visual working memory with dynamic neural fields and near-infrared spectroscopy. In H. Bortfield (Chair), *Methodological advances in understanding functional connectivity as the basis for developmental change*. Paper presented at the 69th Biennial Meeting of the Society for Research in Child Development, Montreal, Canada.

Buss, A. T. & Spencer, J. P. (2009, April). The emergent executive. In **A.T. Buss** (Chair), *The emergence of executive function in early development.* Paper presented at the 68th Biennial Meeting of the Society for Research in Child Development, Denver, CO.

Buss, A. T. & Spencer, J. P. (2008, July). The emergence of rule-use: a DNF model of the DCCS. In **A.T. Buss** (Chair), *Cognitive Development.* Paper presented at the 30th Annual Meeting of the Cognitive Science Society, Washington, DC.

Poster Presentations

Kinder, K,± **Buss, A. T.**, & Tas, A. C. (June, 2020). Tracking flanker task dynamics: Evidence for continuous attentional selectivity. Poster presented at the Annual Meeting of the Vision Science Society, St. Pete Beach, FL.

Ratliff, H.±, Lowery, K.±, Eddings, R.±, Nikam, B.±, Kerr-German, A. N., & **Buss, A. T.** (March, 2020). Neural dynamics during dimensional label learning predicts dimensional attention performance in early childhood. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA.

Lowery, K. N.±, Nikam, B. D.±, & **Buss, A. T.** (March, 2020). Dimensional label learning: A Building block for later dimensional attention. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA.

Smith, M.±, Kerr-German, A. N., & **Buss, A. T.** (March, 2020). Exploring developmental changes in functional connectivity associated with cognitive flexibility. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA.

Nikam, B. D.±, Perone, S., & **Buss, A. T.** (March, 2020). Using a memory game to enhance frontal activation: An fNIRS study. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA.

Eddings, R. & **Buss, A. T.** (March, 2020). Using fNIRS to probe the effects of response type in a visual working memory task. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA.

Lowery, K.±, Nikam B.±, & **Buss, A. T.** (October, 2019). Early dimensional label learning predicts dimensional attention. Poster presented at the 11th Biennial Meeting of the Cognitive Development Society, Louisville, KY.

Eddings, R.± & **Buss, A. T.** (October, 2019). Probing the neural systems of visual working memory using fNIRS. Poster presented at the 11th Biennial Meeting of the Cognitive Development Society, Louisville, KY.

Kerr-German, A. N.[±] & **Buss, A. T.** (October, 2019). The relationship between looking and thinking in early childhood. Poster presented at the 11th Biennial Meeting of the Cognitive Development Society, Louisville, KY.

Nikam, B., Smith, M., & Buss, A. T. (October, 2019). Enhancing neural activation of 3.5-year-olds using a memory game. Poster presented at the 11th Biennial Meeting of the Cognitive Development Society, Louisville, KY.

Cannistraci, R.[±], Hay, J., & **Buss, A. T.** (July, 2019) A dynamic neural model of the McGurk effect and incongruous audiovisual speech stimuli. Poster presented at the 41st Annual Meeting of the Cognitive Science Society, Monteral, QC, Canada.

Kinder, K. T.[±], Eschman, B. T.[±], Ross-Sheehy, S., **Buss, A. T.**, & Tas, A. C. (2019, May). Transsaccadic object updating depends on visual working memory: An fNIRS study. Poster presented at the 19th Annual Meeting of the Vision Science Society, St. Pete Beach, FL.

Kerr-German, A.[±], Lennon, M.[±], & **Buss, A. T.** (2019, March). Resting state functional connectivity predicts EF and attention selectivity in toddlers and preschoolers. Poster presented at the 73rd Biennial Meeting of the Society for Research in Child Development, Baltimore, MD.

Costello, M., Tas, C., & **Buss, A. T.** (2018, November). Aging and working memory: The effect of imprecision in visual representations. Poster presented at the 70th Annual Scientific Meeting of the Gerontological Society of America, Boston, MA.

Defenderfer, J.[±], Hedrick, M., Plyler, P., & **Buss, A. T.** (2018, October). Functional networks between temporal and frontal cortices during effortful listening. Poster presented at the Biennial Meeting of the Society for Functional Near-infrared Spectroscopy, Tokyo, JP.

Kerr-German, A.[±] & **Buss, A. T.** (2018, October). Resting-state connectivity in 2.5- and 3.5-year-olds predicts attention during a flanker task. Poster presented at the Biennial Meeting of the Society for Functional Near-infrared Spectroscopy, Tokyo, JP.

Lowery, K.,[±] Kerr-German, A., & **Buss, A. T.** (2018, October). Neural activation during dimensional label comprehension and production predicts dimensional attention. Poster presented at the Biennial Meeting of the Society for Functional Near-infrared Spectroscopy, Tokyo, JP.

Kinder, K.[±], & **Buss, A. T.** (2018, June). Using a dynamic neural field model to explore the effects of action on memory. Poster presented at Expanding the Field: Multi-disciplinary Developmental Dynamics, Norwich, UK.

Cannistraci, R.[±], Hay, J., & **Buss, A. T.** (2018, June). A dynamic field theory account of audiovisual speech perception: Explaining the McGurk effect and perception of incongruous audiovisual stimuli. Poster presented at Expanding the Field: Multi-disciplinary Developmental Dynamics, Norwich, UK.

Kerr-German, A. N.[±], Lowery, K.[±], Todd, J., Bahrick, L., & **Buss, A. T.** (2017, October). Using fNIRS to investigate the neural basis of intersensory processing. Poster presented at the 10th Biennial Meeting of the Cognitive Development Society, Portland, OR.

Buss, A. T., Hazeltine, E., Magnotta, V., & Spencer, J. P. (2016, November). The influence of bottom-up and top-down processing on task switching. Poster presented at the 57th Annual Meeting of the Psychonomic Society, Boston, MA.

Kinder, K.[±], Tas, A. C., & **Buss, A. T.** (2016, November). Probing the stimulus and response specificity of inhibition-induced forgetting. Poster presented at the 57th Annual Meeting of the Psychonomic Society, Boston, MA.

Costello, M. C., **Buss, A. T.**, Kaplan, D. T., Fera, S. (2016, November). Aging and visual working memory: age-related differences in response bias and variability. Poster presented at the 57th Annual Meeting of the Psychonomic Society, Boston, MA.

Buss, A. T. & Kerr-German, A. N. ± (2016, October). Dimensional label learning drives the development of attention to visual dimensions. Poster presented at the Biennial Meeting of the Society for Near-Infrared Spectroscopy, Paris, France.

Kerr-German, A. N. ± & **Buss, A. T.** (2016, October). The neural dynamics of selective and flexible attention development. Poster presented at the Biennial Meeting of the Society for Near-Infrared Spectroscopy, Paris, France.

Defenderfer, J. ±, Hedrick, M., Kerr-German, A. N. ±, & **Buss, A. T.** (2016, October). Brain-behavior associations in speech perception revealed by fNIRS. Poster presented at the Biennial Meeting of the Society for Near-Infrared Spectroscopy, Paris, France.

Buss, A. T. & Kerr-German, A. N. ± (2015, October). The neural basis of dimensional label learning. Poster presented at the 9th Biennial Meeting of the Cognitive Development Society, Columbus, OH.

Kerr-German, A. N. ± & **Buss, A. T.** (2015, October). A model-based approach to selective and flexible attention. Poster presented at the 9th Biennial Meeting of the Cognitive Development Society, Columbus, OH.

Buss, A. T. & Spencer, J. P. (2015, April). The role of dimensional and featural labels in the DCCS task. Poster presented at the 71st Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Buss, A. T. & Spencer, J. P. (2014, October). Shining light on the neural dynamics of cognitive flexibility in early childhood. Poster presented at the annual meeting of the Society for Functional Near-infrared Spectroscopy, Montreal, QC, Canada.

Wijeakumar, S., Magnotta, V., **Buss, A. T.**, & Spencer, J. P. (2014, May). Probing the neural basis of visual working memory: A validation study using fMRI and fNIRS. Poster presented at the 14th annual meeting of Vision Sciences Society, St. Petersburg, FL.

Samuelson, L., Perone, S. Molitor, S., **Buss, A. T.**, & Spencer, J. P. (2013, July). Dimensional experience induces attention shifting in the Dimensional Change Card Sort (DCCS) task. Poster presented at the 35th Annual Meeting of the Cognitive Science Society, Berlin, Germany.

Spencer, J. P., **Buss, A. T.**, & Magnotta, V. (2013, July). Probing the neural dynamics of visual working memory with dynamic fields and fMRI. Poster presented at the 35th Annual Meeting of the Cognitive Science Society, Berlin, Germany.

Spencer, J. P., **Buss, A. T.,** & Magnotta, V. (2013, May). Testing hemodynamic predictions of a dynamic neural field model of visual working memory. Poster presented at the 13th annual meeting of Vision Sciences Society, Naples, FL.

Buss, A. T. & Spencer, J. P. (2013, April). Grounding the emergence of flexible rule-use in dimensional word learning. Poster presented at the 70th Biennial Meeting of the Society for Research in Child Development, Seattle, WA.

Spencer, J. P., **Buss, A. T.,** & Fox, N. (2013, April). Changes in frontal and parietal activation as visual working memory capacity develops. Poster presented at the 70th Biennial Meeting of the Society for Research in Child Development, Seattle, WA.

Molitor, S., Perone, S., **Buss, A. T.,** Spencer, J. P., & Samuelson, L. K. (2013, April). Overcoming conflict: The role of dimensional experience in the DCCS task. Poster presented at the 70th Biennial Meeting of the Society for Research in Child Development, Seattle, WA.

Buss, A. T., Wifall, T., Hazeltine, E., & Spencer, J. P. (2012, November). The interaction of inhibition, working-memory, and task-switching in a suite of executive function tasks.

Poster presented at the 52nd Annual Meeting of the Psychonomic Society, Minneapolis, MN.

Buss, A. T., Wifall, T., Schöner, G., Hazeltine, E., & Spencer, J. P. (2011, November). Integrating mind and body in a response selection task: from neural decisions to mouse trajectories…and back again. Poster presented at the 52nd Annual Meeting of the Psychonomic Society, Seattle, WA.

Buss, A. T. & Spencer, J. P. (2011, October). Integrating behavioral and neural dynamics over development in the Dimensional Change Card Sort (DCCS) task. Poster presented at the Biennial Meeting of the Cognitive Development Society, Philadelphia, PA.

Buss, A. T. & Spencer, J. P. (2011, July). Bridging the gap between the brain and behavior: A dynamic neural field model of executive function captures behavioral and neural development. Poster presented at the 33rd Annual Meeting of the Cognitive Science Society, Boston, MA.

Buss, A. T. & Spencer, J. P. (2011, March). The role of conflict, target cards, and demonstrations in the Dimensional Change Card Sort (DCCS) task. Poster presented at the 69th Biennial Meeting of the Society for Research in Child Development, Montreal, Canada.

Buss, A. T., Spencer, J. P., Wifall, T., & Hazeltine, E. (2010, November). A dynamic neural field model of the hemodynamics associated with response selection and dual-task. Poster presented at the Annual Meeting of the Psychonomic Society, St. Louis, MO.

Wifall, T., **Buss, A. T.,** Spencer, J. P., & Hazeltine, E. (2010, November). The role of metrics in response selection. Poster presented at the Annual Meeting of the Psychonomic Society, St. Louis, MO.

Buss, A. T., Wifall, T., Hazeltine, E., & Spencer, J. P. (2009, November). A dynamic neural field model of response selection using a dual task paradigm. Poster presented at the Annual Meeting of the Psychonomic Society, Boston, MA.

Buss, A. T. & Spencer, J. P. (2009, October). The role of visual cues in children's rule representation. Poster presented at Cognitive Development Society, San Antonio, TX.

Ziemer, C. J., **Buss, A. T.**, Spencer, J. P., & Plumert, J. M. (2009, October). Capturing development in object replacement with the DFT. Poster presented at Cognitive Development Society, San Antonio, TX.

Buss, A. T. & Spencer, J. P. (2009, July). Automatic and voluntary shifts of attention in a Dynamic Neural Field model of the Dimensional Change Card Sort task. Poster presented at the 31st Annual Meeting of the Cognitive Science Society, Amsterdam, Netherlands.

Ziemer, C. J., **Buss, A. T.**, Spencer, J. P., & Plumert, J. M. (2009, April). The recall of 'where' is affected by 'what': capturing categorical biases with Dynamic Field Theory. Poster presented at the 68th Biennial Meeting of the Society for Research in Child Development, Denver, CO.

Buss, A. T. & Spencer, J. P. (2008, August). The role of space in children's rule-use: a DNF model of the DCCS. Poster presented at the Development of Executive Functions Workshop, Oxford, United Kingdom.

Buss, A. T. & Whitfield, L. C. (2007, April). Applying a dynamic systems perspective to the DCCS. Poster presented at the 67th Biennial Meeting of the Society for Research in Child Development, Boston, MA.

Teaching

Thesis Chair

Completed

MA Anastasia Kerr-German, Psychology (completed, Spring 2015 – Fall 2016)

PhD Anastasia Kerr-German, Psychology (Fall 2016 –Spring 2019)
MA Meagan Smith, Psychology (Spring 2019-Spring 2020)
MA Rachel Eddings, Psychology (Fall 2018-Summer 2020)

In Progress
PhD Kaleb Kinder, Psychology (Fall 2016 – present)
PhD Kara Lowery, Psychology (Fall 2016 – present)
PhD Jessica Defenderfer, Audiology and Speech Pathology (Spring 2016 – present)
MA Hollis Ratliff, Psychology (Fall 2019 – present)

Thesis Committees

Completed
MA Ferhat Karaman, Psychology (Spring 2016)
MA Ryan Cannistracci, Psychology (Fall 2017)
MA Kelly Roth, Psychology (Fall, 2017)
PhD Rebecca Weiner, Psychology (Spring 2018)
MA Jenna Gilmore, Psychology (Spring 2018)
PhD Ferhat Karaman, Psychology (Spring 2018)
MA Sara Parvanezadeh, Psychology (Fall, 2018)
PhD David Thornton, Audiology and Speech Pathology (Spring 2019)
PhD Bret Eschman, Psychology (Spring 2019)
MA Amanda Rosales, Psychology (Spring 2020)
MA Esther Reynolds, Psychology (Spring 2020)
PhD Kelly Roth, Psychology (Fall 2020)

In Progress
PhD Ryan Cannistracci, Psychology
PhD Sara Parvanezadeh, Psychology
PhD Emily Mariotti, Psychology

Courses Taught

Fall 2020	Instructor, Seminar:
Spring 2019	Instructor, Brain and Behavior Development, University of Tennessee (PSYC 524)
Fall 2018	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Spring 2018	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Spring 2018	Instructor, Seminar: MatLab Programming for Psychological Sciences (PSYC 601)
Spring 2017	Instructor, Child Psychology (2 sections), University of Tennessee (PSYC 300)
Fall 2016	Instructor, Seminar: Dynamic Field Theory, University of Tennessee (PSYC 510)
Fall 2016	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Spring 2016	Instructor, Brain and Behavior Development, University of Tennessee (PSYC 524)
Spring 2016	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Fall 2015	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Summer 2015	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Spring 2015	Instructor, Special Topics: Executive Function, University of Tennessee (PSYC 482)
Spring 2015	Instructor, Child Psychology, University of Tennessee (PSYC 300)
Fall 2014	Instructor, Special Topics: Executive Function, University of Tennessee (PSYC 482)
Summer 2014	Instructor, Introduction to Developmental Science, University of Iowa

Spring 2014	Instructor, Introduction to Developmental Science, University of Iowa
Summer 2010	Instructor, Introduction to Cognitive Psychology, University of Iowa
2008-2012	Tutor, Dynamic Field Theory Summer School, University of Iowa
2007-2008	Teaching Assistant, Introduction to Child Development, University of Iowa

Undergraduate Research Assistants

Fall 2021	Alexis McCraw
	Ashley Miller
	Walker Taylor
	Aubrey Doll
	Maggie Moeller
	Kaitlyn Marek
Spring 2021	Alexis McCraw
	Ashley Miller
Fall 2020	Alexis McCraw
	Ashley Miller
Spring 2020	Michael Abraham
	Anastasia Fancher
	Rebeca Herrarte
	Savannah Ledbetter
	Alexis McCraw
	Ashley Miller
	Megan Montana
	Katherine Peterson
Fall 2019	Anastasia Fancher
	Chardae Foster
	Ashley Miller
	Megan Montana
	Marah Yaun
Spring 2019	Anastasia Fancher
	Savannah Ledbetter
	Chengrui Li
	Angus Mackenzie
	Corinne Maldonado
	Megan Montana
	Marah Yaun
Fall 2018	Abigail Anderson
	Maigread Lennon
	Chengrui Li
	Elizabeth Martens
	Megan Montana
	Marah Yaun
Spring 2018	Rachel Eddings
	Bhoomika Nikam
	Sean Toll
	Asante Knowles
Fall 2017	Rachel Eddings

	Bhoomika Nikam
	Thomas Neuefeind
	Jaron Rowland
	Asante Knowles
	Sean Toll
Spring 2017	Rachel Eddings
	Alexa Saravi
	Ian Smith
	Charleston Yanders
	Kaelyn Barker
	Bhoomika Nikam
	Thomas Neuefeind
	Siyu Lin
Fall 2016	Rebekah Coopman
	Rachel Eddings
	Lauren Gibson
	Carissa Hatcher
	Alexa Saravi
	Ian Smith
Spring 2016	Ian Smith
	William Vest
	Jessica Thacker
	Allison Stanley
Fall 2015	Ian Smith
Spring 2015	Sheharyar Abbasi
Fall 2014	Charles Coyle