

# Glenn Gunzelmann

## Principal Research Psychologist

### Training Core Technical Competency Lead

Air Force Research Laboratory, 711<sup>th</sup> Human Performance Wing  
Warfighter Readiness Research Division (711 HPW/RHA)

#### Education

- 2003: Ph.D. (Cognitive Psychology)  
**Carnegie Mellon University**, Pittsburgh, PA  
Thesis Title: Orientation tasks involving the integration of multiple perspectives  
Advisor: John R. Anderson
- 1999: M.S. (Cognitive Psychology)  
**University of Florida**, Gainesville, FL  
Thesis Title: Why are some problems easy? New perspectives on the Tower of Hanoi  
Advisor: Stephen B. Blessing
- 1997: B.A. (Psychology)  
**Albright College**, Reading PA  
Summa Cum Laude, with Honors in Psychology  
Advisor: Patricia A. Snyder

#### Employment

- 2020-PRES Principal Research Psychologist – Air Force Research Laboratory (AFRL)
- 2018-PRES Training Core Technical Competency Lead, Warfighter Readiness Research Division
- 2010-2018 Science & Technology Advisor, Cognitive Models and Agents Branch
- 2009-2019 Senior Research Psychologist – Air Force Research Laboratory (AFRL)
- 2004-2008 Research Psychologist – Air Force Research Laboratory (AFRL)
- 2005-2011 Adjunct Faculty – Arizona State University, Polytechnic Campus  
Department of Applied Psychology
- 2003-2004 Postdoctoral Research Associate – National Research Council, AFRL

#### Other Professional Roles

- 2013-PRES Adjunct Graduate Faculty – Wright State University
- 2016-2019 Subarea Lead for Personalized Assessment, Education, and Training within the  
Department of Defense's Human Systems Community of Interest
- 2016-2019 Air Force representative and government lead for Personalized Assessment, Education  
and Training for the National Defense Industry Association (NDIA) Human Systems  
Division

#### Honors and Awards

- 2020: Fellow, Association for Psychological Science
- 2016: Human Effectiveness Directorate, Laboratory Scientist of the Quarter (FY16, Q2)
- 2014: Fellow, Psychonomic Society
- 2012: Air Force Research Laboratory Nominee for the 64<sup>th</sup> Arthur S. Flemming Awards (Leadership  
and/or Management)
- 2011: 711 Human Performance Wing, Scientific and Technical Management Award
- 2010: Star Team Award: Air Force Office of Scientific Research (AFOSR)

Project: Representations and Processes of Spatial Visualization

- 2010: Named as an Advisor for the National Research Council's Research Associateship Program
- 2009: Air Force Research Laboratory (AFRL) Nominee for the Air Force Science and Technology Harold Brown Award
- 2009: 711<sup>a</sup> Human Performance Wing Nominee for the 60th Arthur S. Flemming Awards
- 2008: Recommended Reading List (Best Papers) – Behavior Representation in Modeling and Simulation
- 2007: Computational Modeling Prize for Applied Cognition: 29<sup>th</sup> Annual Meeting of the Cognitive Science Society
- 2007: Civilian of the Quarter (FY07, 2Q) – Air Force Research Laboratory, Warfighter Readiness Research Division (AFRL/RHA)
- 2007: Recommended Reading List (Best Papers) – Behavior Representation in Modeling and Simulation
- 2006: Best paper award: 2006 Interservice/Industry Training, Simulation, and Education Conference
- 2006: Star Team Award: Air Force Office of Scientific Research (AFOSR)  
Project: Orientation and Navigation in Virtual Environments
- 2003: National Research Council Postdoctoral Research Associateship Award
- 2002: Finalist, Marr Prize (Best Student Paper) – 24<sup>th</sup> Annual Meeting of the Cognitive Science Society
- 1997: Grinter Fellowship – University of Florida, Gainesville, FL
- 1993: Jacob Albright Scholarship – Albright College, Reading, PA

**Mentorship**

Postdocs

- Lorraine Borghetti (2019-Present)
- Chris Fisher (2016-2019)
- Angela McDowell (2015-2016)
- Bella Veksler (2011-2017)
- Timothy Halverson (2009-2011)

Graduate Students (Summer Internships)

- Samantha Riedy (2016; Washington State University Spokane; Graduate Advisor: Hans Van Dongen)
- Nia Bradley (2014; Carnegie Mellon University; Graduate Advisor: Bhiksha Raj)
- Kimberly Honn (2014; Washington State University Spokane; Graduate Advisor: Hans Van Dongen)
- Daniel Gartenberg (2013; George Mason University; Graduate Advisor: Raja Parasuraman/Greg Trafton)  
\*Member of dissertation committee (2013-2016)
- Keith Kline (2010; Georgia Institute of Technology; Graduate Advisor: Richard Catrambone)
- Peter Kooshabeh (2008; University of California, Santa Barbara; Graduate Advisor: Mary Hegarty)
- Eric Dimperio (2007; Indiana University; Graduate Advisor: Robert Goldstone)
- Joshua Gross (2005; The Pennsylvania State University; Graduate Advisor: Mary Beth Rosson)

Post-Baccalaureate & Undergraduates

- Megan Wiedbusch (2016-Present; B.A., University of North Carolina, Chapel Hill)
- Reem Hassan (2016; Summer Research Intern; Student, Wright State University)
- Ashley Chafin (2015-Present; Lab Manager; M.A., Cleveland State University)

Rachel Boyd (2014-2016; Research Assistant; B.S., University of Illinois, Urbana-Champaign)  
Haley Wilson (2014-2016; Lieutenant, U.S. Air Force; B.S. U.S. Air Force Academy)  
Joseph Benincasa (2011-2013; Research Assistant; B.A., University of Rochester)  
Monica Nguyen (2008-2011/2012-2014; Lab Manager; Student, B.A., Arizona State University)  
L. Richard Moore (2007-2013; Research Scientist; M.S., Arizona State University)  
Erin Hanson (2012; Summer Research Intern; Student, Georgia Institute of Technology)  
Rayka Mohebbi (2008-2011; Research Programmer; M.S., Arizona State University)  
Marissa Daigle (2010; Summer Research Intern; Student, Clemson University)  
Sharon Lebeau (2004-2006; Research Assistant; B.A., Arizona State University)

### **Research Interests**

Computational Cognitive Modeling  
Influence of Cognitive Modulators (e.g., Fatigue) on Performance  
Spatial Information Processing and Spatial Reasoning  
High-level Cognition (e.g., Reasoning, Problem Solving, Decision-making)

### **Funding (Total: \$8,887,000)**

#### Active

An Analytic Framework Enabling Comparison of Major Theoretical Frameworks in Sequential Decision-Making

Funded By: Air Force Office of Scientific Research (PM: Dr. Doug Rieken)  
Co-Principal Investigator, with L. Blaha (PI), J. Houpt (Co-PI), and C. Fisher (Co-PI)  
October 2020 to September 2023 (\$414K)

Monitoring and Modeling Fatigue in Joint Operational Environments

Funded By: Joint Program Committee on Military Operational Medicine, Fatigue Mechanisms and Countermeasures Working Group  
Co-Principal Investigator, with M. Morris (PI), L. Caldwell (Co-PI) and D. Russell (Co-PI)  
October 2020 to September 2023 (\$1,400K)

#### Completed

Development of Analytic Representations of a Computational Cognitive Architecture

Funded By: Air Force Office of Scientific Research (PM: Dr. Doug Rieken)  
Principal Investigator, with J. Houpt (Co-PI) and C. Fisher (Co-PI)  
October 2017 to September 2020 (\$304K)

Fatigue Simulations for Single Pilot Aircraft Operations

Funded By: Joint Program Committee on Military Operational Medicine, Fatigue Mechanisms and Countermeasures Working Group  
Principal Investigator, with C. King (co-PI)  
October 2015 to August 2019 (\$1,241K)

Modeling the Whole Airman through the Integration of Human Physiological and Cognitive Modeling Frameworks

Funded By: AFRL Human Performance Wing Chief Scientist's Office (Dr. Rajesh Naik)  
Co-Principal Investigator, with C. Myers (PI), J. Gearhart, and E. Hack (co-PIs)  
March 2016 to February 2017 (\$100K)

Real-Time Cognitive Model-Based Fatigue Monitoring

Funded By: AFRL Human Performance Wing Chief Scientist's Office (Dr. Rajesh Naik)  
Principal Investigator, with L. Blaha, J. Harris, C. Fisher, M. Walsh, and B. McClure (co-PIs)  
March 2016 to February 2017 (\$100K)

Modeling Fatigue from Prolonged Driving

- Funded By: Air Force International Cooperative Research & Development Program  
U.S. Principal Investigator, with L. H. Teo (Singapore PI)  
October 2014 to September 2017 (\$325K)
- Calibrating Cognitive Models to Establish Real-Time Performance Metrics for Adaptive Computer-Human Interfaces  
Funded By: AFRL Human Performance Wing Chief Scientist's Office (Dr. Jim Overholt)  
Co-Principal Investigator, with L. Blaha (PI)  
April 2015 to April 2016 (\$100K)
- Adaptive Design Optimization for Model Comparison of the Spacing Effect  
Funded By: Air Force Office of Scientific Research (PM: Dr. Jay Myung)  
Co-Principal Investigator, with T. Jastrzembki (PI) and K. A. Gluck (Co-PI)  
October 2012 to September 2015 (\$484K)
- Computational Approaches for Understanding Vigilance and Mental Fatigue  
Funded By: Air Force Office of Scientific Research (PM: Dr. James Lawton)  
Co-Principal Investigator, with B. Z. Veksler (Co-PI) and M. M. Walsh (Co-PI)  
October 2013 to September 2014 (\$245K)
- Representations and Processes of Spatial Visualization  
Funded By: Air Force Office of Scientific Research (PM: Dr. Jun Zhang)  
Principal Investigator, with D. R. Lyon (Co-PI) and S. A. Douglass (Co-PI)  
October 2009 to September 2013 (\$600K)
- Computational Modeling of Task-Type Specific Phenomena in Vigilance  
Funded By: AFRL Human Performance Wing Chief Scientist's Office (Dr. Morley Stone)  
Principal Investigator, with G. Funke, T. Halverson, & J. Warm (Co-PIs)  
February 2012 to February 2013 (\$100K)
- Modeling the Relationships between Alertness and Cognitive Processes  
Funded By: Air Force Office of Scientific Research (PM: Dr. Willard Larkin)  
Principal Investigator, with K. A. Gluck (Co-PI)  
October 2009 to September 2012 (\$773K)
- Homeostatic and Circadian Modulation of Cognition: Integrating Mathematical and Computational Modeling Approaches  
Funded By: Air Force Office of Scientific Research (PM: Dr. Willard Larkin)  
AFRL Principal Investigator, with H. P. A. Van Dongen (PI, Washington State University Spokane) and G. Belenky (Co-PI, WSU Spokane).  
October 2008 to September 2011 (\$311K)
- Computational Process Models of the Effects of Fatigue on Cognition  
Funded By: Air Force Office of Scientific Research (PM: Dr. Willard Larkin)  
Principal Investigator, with K. A. Gluck (Co-PI).  
October 2006 to September 2009 (\$650K)
- Computational Models of Orientation and Navigation in Virtual Environments  
Funded By: Air Force Office of Scientific Research (PMs: Dr. Jerry Busemeyer, Dr. Bob Sorkin)  
Co-Principal Investigator with J. T. Ball, K. A. Gluck, and D. R. Lyon.  
October 2004 to September 2009 (\$1,500K)
- Modeling Fatigue with Computational Cognitive Architectures  
Funded By: Air Force Office of Scientific Research (PM: Dr. Willard Larkin)  
Co-Principal Investigator with K. A. Gluck (PI).  
October 2003 to September 2006 (\$160K)
- National Research Council Postdoctoral Research Associate – Air Force Research Laboratory  
Selected to receive postdoctoral funding through a single slot available within the Air Force Research Laboratory (Funded through AFOSR)  
October 2003 to September 2004 (\$80K)

## Publications

### Journal Articles (Published & In Press: 37 Total)

- Fisher, C. R., Houpt, J. W., & Gunzelmann, G. (2020). Developing memory-based models of ACT-R within a statistical framework. *Journal of Mathematical Psychology*, 98, #102416. (DOI: 10.1016/j.jmp.2020.102416)
- Gaines, A. R., Morris, M. B., & Gunzelmann, G. (2020). Fatigue-related aviation mishaps. *Aerospace Medicine and Human Performance*, 91(5), 440-447. (DOI: 10.3357/AMHP.5515.2020)
- Honn, K. A., Halverson, T., Jackson, M. L., Krusmark, M., Chavali, V. P., Gunzelmann, G., & Van Dongen, H. P. A. (2020). New insights into the cognitive effects of sleep deprivation by decomposition of a cognitive throughput task. *Sleep*, 43(7), zsz219. (DOI: 10.1093/sleep/zsz319)
- Morris, M. B., Howland, J. P., Amaddio, K. M., & Gunzelmann, G. (2020). Aircrew fatigue perceptions, fatigue mitigation strategies, and circadian typology. *Aerospace Medicine and Human Performance*, 91(4), 363-368. (DOI: 10.3357/AMHP.5396.2020)
- Gunzelmann, G. (2019). Promoting cumulation in models of the human mind. *Computational Brain & Behavior*, 2(3-4), 157-159. (DOI: 10.1007/s42113-019-00060-z)
- Lyon, D. R., Gunzelmann, G., & Krusmark, M. (2019). Path Visualization: A Method for objective measurement of the spatial mental image. *Spatial Cognition and Computation*, 19(4), 309-333. (DOI: 10.1080/13875868.2019.1643867)
- Fisher, C., Houpt, J., & Gunzelmann, G. (2018). A Comparison of Approximations for Base-level Activation in ACT-R. *Computational Brain & Behavior*, 1, 228-236. (DOI: 10.1007/s42113-018-0015-3)
- Gartenberg, D., Gunzelmann, G., Hassanzadeh, S., & Trafton, J. G. (2018). Examining the role of task requirements in the magnitude of the vigilance decrement. *Frontiers in Psychology*, 9, article #1504. (DOI: 10.3389/fpsyg.2018.01504)
- Gunzelmann, G., & Veksler, B. Z. (2018). Further Evidence that Sleep Deprivation Effects and the Vigilance Decrement Are Functionally Equivalent: Reply to Altmann (2018). *Cognitive Science*, 42(2), 712-717. (DOI: 10.1111/cogs.12588)
- Haubert, A. R., Walsh, M. M., Boyd, R., Morris, M. B., Wiedbusch, M., Krusmark, M., & Gunzelmann, G. (2018). Relationship of changes in event-related potentials to the vigilance decrement. *Frontiers in Psychology*, 9, 1-11. (DOI: 10.3389/fpsyg.2018.00237)
- Morris, M. B., Wiedbusch, M., & Gunzelmann, G. (2018). Fatigue incident antecedents, consequences, and aviation operational risk management resources. *Aerospace Medicine and Human Performance*, 89(8), 708-716. (DOI: 10.3357/AMHP.5019.2018)
- Veksler, B. Z., & Gunzelmann, G. (2018). Functional equivalence of sleep loss and time on task effects in sustained attention. *Cognitive Science*, 42(2), 600-632. (DOI: 10.1111/cogs.12489)
- Walsh, M. M., Gluck, K. A., Gunzelmann, G., Jastrzembski, T., & Krusmark, M. (2018). Evaluating the theoretical adequacy and applied potential of computational models of the spacing effect. *Cognitive Science*, 42(S3), 644-691. (DOI: 10.1111/cogs.12602)
- Walsh, M. M., Gluck, K. A., Gunzelmann, G., Jastrzembski, T., & Krusmark, M., Myung, J., Pitt, M., & Zhou, R. (2018). Mechanisms underlying the spacing effect in learning: A comparison of three computational models. *Journal of Experimental Psychology: General*, 147(9), 1325-1348. (DOI: 10.1037/xge0000416)
- Gunzelmann, G., & Lyon, D. R. (2017). Constructing representations of spatial location from briefly presented displays. *Cognitive Processing*, 18(1), 81-85. (DOI:10.1007/s10339-016-0775-4)
- Veksler, B. Z., Boyd, R., Myers, C. W., Gunzelmann, G., Neth, H., & Gray, W. D. (2017). Visual working memory resources are best characterized as dynamic, quantifiable mnemonic traces. *Topics in Cognitive Science*, 9(1), 83-101. (DOI: 10.1111/tops.12248)

- Walsh, M. M., Gunzelmann, G., & Anderson, J. A. (2017). Relationship of P3b single-trial latencies and response times in one, two, and three-stimulus oddball tasks. *Biological Psychology*, *123*, 47-61. (DOI: 10.1016/j.biopsycho.2016.11.011)
- Walsh, M. M., Gunzelmann, G., & Van Dongen, H. P. A. (2017). Computational cognitive models of the temporal dynamics of fatigue from sleep loss. *Psychonomic Bulletin & Review*, *24*, 1785-1807. (DOI 10.3758/s13423-017-1243-6)
- Gunzelmann, G., Veksler, B. Z., Walsh, M. M., & Gluck, K. A. (2015). Understanding and predicting the cognitive effects of sleep loss through simulation. *Translational Issues in Psychological Science*, *1(1)*, 106-115. (DOI: 10.1037/tps0000017)
- Moore, L. R., & Gunzelmann, G. (2014). An interpolation approach for fitting computationally intensive models. *Cognitive Systems Research*, *29-30*, 53-65. (DOI: 10.1016/j.cogsys.2013.09.001)
- Jackson, M. L., Gunzelmann, G., Whitney, P., Hinson, J. M., Belenky, G., Rabat, A., & Van Dongen, H. P. A. (2013). Deconstructing and reconstructing cognitive performance in sleep deprivation. *Sleep Medicine Reviews*, *17*, 215-225. (DOI: 10.1016/j.smrv.2012.06.007)
- Moore, L. R., & Gunzelmann, G. (2013). Task artifacts and strategic adaptation in the change signal task. *Cognitive Systems Research*, *24(1)*, 35-42. (DOI: 10.1016/j.cogsys.2012.12.001)
- Gunzelmann, G., Gluck, K. A., Moore, L. R., & Dinges, D. F. (2012). Diminished access to declarative knowledge with sleep deprivation. *Cognitive Systems Research*, *13(1)*, 1-11. (DOI:10.1016/j.cogsys.2010.09.001)
- Gunzelmann, G. (2011). Introduction to the topic on modeling spatial cognition. *Topics in Cognitive Science*, *3(4)*, 628-631. (DOI: 10.1111/j.1756-8765.2011.01160.x)
- Gunzelmann, G., & Lyon, D. R. (2011). Representations and processes of human spatial competence. *Topics in Cognitive Science*, *3(4)*, 741-759. (DOI: 10.1111/j.1756-8765.2011.01153.x)
- Gunzelmann, G., Moore, L. R., Salvucci, D. D., & Gluck, K. A. (2011). Sleep loss and driver performance: Quantitative predictions with zero free parameters. *Cognitive Systems Research*, *12(2)*, 154-163. (DOI:10.1016/j.cogsys.2010.07.009)
- Lyon, D. R., & Gunzelmann, G. (2011). Functional equivalence and spatial path memory. *Quarterly Journal of Experimental Psychology*, *64(11)*, 2081-2087. (DOI: 10.1080/17470218.2011x.618227)
- Myers, C. W., Gluck, K. A., Gunzelmann, G., & Krusmark, M. (2010). Validating computational cognitive process models across multiple timescales. *Journal of Artificial General Intelligence*, *2(1)*, 108-127. (DOI: 10.2478/v10229-011-0012-6)
- Gunzelmann, G., Byrne, M. D., Gluck, K. A., & Moore, L. R. (2009). Using computational cognitive modeling to predict dual-task performance with sleep deprivation. *Human Factors*, *51(2)*, 251-260. (DOI: 10.1177/0018720809334592)
- Gunzelmann, G., & Gluck, K. A. (2009). An integrative approach to understanding and predicting the consequences of fatigue on cognitive performance. *Cognitive Technology*, *14(1)*, 14-25.
- Gunzelmann, G., Gross, J. B., Gluck, K. A., & Dinges, D. F. (2009). Sleep deprivation and sustained attention performance: Integrating mathematical and cognitive modeling. *Cognitive Science*, *33(5)*, 880-910. (DOI: 10.1111/j.1551-6709.2009.01032.x)
- Gunzelmann, G. (2008). Strategy generalization across orientation tasks: Testing a computational cognitive model. *Cognitive Science*, *32(5)*, 835-861. (DOI: 10.1080/03640210802221957)
- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2008). A computational model of spatial visualization capacity. *Cognitive Psychology*, *57*, 122-152. (DOI:10.1016/j.cogpsych.2007.12.003)
- Kronauer, R. E., Gunzelmann, G., Van Dongen, H. P. A., Doyle, F. J. III, & Klerman, E. B. (2007). Uncovering physiologic mechanisms of circadian rhythms through mathematical modeling. *Journal of Biological Rhythms*, *22(3)*, 233-245. (DOI: 10.1177/0748730407301237)

- Gunzelmann, G., & Anderson, J. R. (2006). Location matters: Why target location impacts performance in orientation tasks. *Memory & Cognition*, *34*(1), 41-59. (DOI: 10.3758/BF03193385)
- Gunzelmann, G., Anderson, J. R., & Douglass, S. (2004). Orientation tasks with multiple views of space: Strategies and performance. *Spatial Cognition and Computation*, *4*(3), 207-253. (DOI: 10.1207/s15427633scc0403\_2)
- Gunzelmann, G., & Anderson, J. R. (2003). Problem solving: Increased planning with practice. *Cognitive Systems Research*, *4*, 57-76. (DOI: 10.1016/S1389-0417(02)00073-6)

Journal Articles (Under Review & In Preparation): Available on Request

- Veksler, B. Z., Morris, M. B., Krusmark, M. A., & Gunzelmann, G. (under review). Integrated modeling of fatigue impacts on C-17 approach and landing performance. *Manuscript under review*.
- Walsh, M. M., Krusmark, M. A., Jastrzembski, T., Hansen, D. A., Honn, K. A., & Gunzelmann, G. (under review). Enhancing learning and retention through the distribution of practice repetitions across multiple sessions. *Manuscript under review*.

Edited Volumes and Journal Issues (3 Total)

- Gunzelmann, G., Howes, A., Tenbrink, T., & Davelaar, E. (Eds.). (2017). *Proceedings of the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society*. Austin, TX: Cognitive Science Society. (ISBN: 978-0-99-11967-6-0)
- Gunzelmann, G. (Ed.) (2011). Modeling spatial cognition. *Topics in Cognitive Science*, *3*(4).
- Salvucci, D. D., & Gunzelmann, G. (Eds.). (2010). *Proceedings of the 10th Annual Conference on Cognitive Modeling*. Philadelphia, PA: Drexel University.

Book Chapters (6 Total)

- Gunzelmann, G., James, S. M., & Caldwell, J. L. (2019). Basic and applied science interactions in fatigue understanding and risk mitigation. In P. Whitney, J. Hinson, M. Chee, K. Honn, & H. P. A. Van Dongen, *Progress in Brain Research (Volume 246): Sleep Deprivation and Cognition* (pp. 177-204). Academic Press.
- Jastrzembski, T., Walsh, M. M., Krusmark, M., Kardong-Edgren, S., Oermann, M., Dufour, K., Millwater, T., Gluck, K. A., Gunzelmann, G., Harris, J., & Stefanidis, D. (2017). Personalizing training to acquire and sustain competence through use of a cognitive model. In D. D. Schmorow & C. M. Fidopiastis, *Augmented cognition. Enhancing cognition and behavior in complex environments* (pp. 148-161). Switzerland: Springer International Publishing AG.
- Gluck, K. A., & Gunzelmann, G. (2013). Computational process modeling and cognitive stressors: Background and prospects for application in cognitive engineering. In J. D. Lee & A. Kirlik, *The Oxford Handbook of Cognitive Engineering* (pp. 424-432). New York, NY: Oxford University Press.
- Gunzelmann, G., Moore, L. R., Gluck, K. A., Van Dongen, H. P. A., & Dinges, D. F. (2011). Fatigue in sustained attention: Generalizing mechanisms for time awake to time on task. In P. L. Ackerman (Ed.), *Cognitive Fatigue: Multidisciplinary Perspectives on Current Research and Future Applications* (pp. 83-96). Washington, DC: American Psychological Association.
- Gunzelmann, G., Gluck, K. A., Price, S. C., Van Dongen, H. P. A., & Dinges, D. F. (2007). Decreased arousal as a result of sleep deprivation: The unraveling of cognitive control. In W. D. Gray (Ed.), *Integrated Models of Cognitive Systems* (pp. 243-253). New York: Oxford University Press.
- Gunzelmann, G., & Lyon, D. R. (2007). Mechanisms of human spatial competence. In T. Barkowsky, M. Knauff, G. Ligozat, and D. Montello (Eds.), *Spatial Cognition V: Reasoning, Action, Interaction. Lecture Notes in Artificial Intelligence #4387* (pp. 288-307). Berlin, Germany: Springer-Verlag.

Refereed Conference Papers (47 Total)

- Morris, M. B., Haubert, A. R., & Gunzelmann, G. (in press). Beyond the vigilance end-spurt with event-related potentials. In *Proceedings of the Human Factors and Ergonomics Society 58<sup>th</sup> Annual Meeting*. Thousand Oaks, CA: SAGE.
- Veksler, B. Z., Morris, M. B., Krusmark, M. A., Gunzelmann, G. (2020). Integrated model of fatigue and C-17 approach and landing performance. In *Proceedings of the 18<sup>th</sup> International Conference on Cognitive Modeling*.
- Khosroshahi, E. B., Salvucci, D. D., Gunzelmann, G., & Veksler, B. Z. (2019). A unified model of fatigue in a cognitive architecture: Time-of-day and time-on-task effects on task performance. In A. Goel, C. Seifert, & C. Freksa (Eds.), *Proceedings of the 41<sup>st</sup> Annual Meeting of the Cognitive Science Society* (pp. 567-573). Montreal, Canada: Cognitive Science Society.
- Fisher, C. R., Myers, C., Hassan, R., Stevens, C., Hack, C., Gearhart, J., & Gunzelmann, G. (2017). A cognitive-pharmacokinetic computational model of the effect of toluene on performance. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. Davelaar, *Proceedings of the 39<sup>th</sup> Annual Meeting of the Cognitive Science Society* (pp. 355-360). Austin, TX: Cognitive Science Society.
- Jastrzemski, T. S., Walsh, M. M., Krusmark, M., Kardong-Edgren, S., Oermann, M., Dufour, K., Millwater, T., Gluck, K. A., Gunzelmann, G., Harris, J., & Stefanidis, D. (2017). Personalizing training to acquire and sustain competence through use of a cognitive model. In *Proceedings of the International Conference on Augmented Cognition* (pp. 148-161). Springer, Cham.
- Blaha, L. M., Fisher, C. R., Walsh, M. M., Veksler, B. Z., & Gunzelmann, G. (2016). Real-time fatigue monitoring with computational cognitive models. In *Foundations of Augmented Cognition: Neuroergonomics and Operational Neuroscience; Volume 9743 of the series Lecture Notes in Computer Science* (pp. 299-310). Berlin, Germany: Springer.
- Collins, M. G., Gluck, K. A., Walsh, M. M., Krusmark, M. & Gunzelmann, G. (2016). Using prior data to inform model parameters in the Predictive Performance Equation. In A. Papafragou, D. Grodner, D. Mirman, & J. C. Trueswell, J.C. (Eds.). *Proceedings of the 38<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 75-80). Austin, TX: Cognitive Science Society.
- Fisher, C., Walsh, M. M., Blaha, L. M., & Gunzelmann, G., & Veksler, B. Z. (2016). Efficient parameter estimation of cognitive models for real-time performance monitoring and adaptive interfaces. In D. Reitter and F. E. Ritter (Eds.), *Proceedings of the 14<sup>th</sup> International Conference on Cognitive Modeling* (pp. 113-118). State College, PA: The Pennsylvania State University.
- Khosroshahi, E. B., Salvucci, D. D., Veksler, B. Z., & Gunzelmann, G. (2016). Capturing the effects of moderate fatigue on driver performance. In D. Reitter and F. E. Ritter (Eds.), *Proceedings of the 14<sup>th</sup> International Conference on Cognitive Modeling* (pp. 163-168). State College, PA: The Pennsylvania State University.
- Veksler, B. Z., Boyd, R., Myers, C. W., Gunzelmann, G., Neth, H., & Gray, W. D. (2016). The representation of visual working memory. In D. Reitter and F. E. Ritter (Eds.), *Proceedings of the 14<sup>th</sup> International Conference on Cognitive Modeling* (pp. 46-51). State College, PA: The Pennsylvania State University.
- Gartenberg, D., Gunzelmann, G., Veksler, B. Z., & Trafton, J. G. (2015). Improving vigilance analysis methodology: Questioning the successive versus simultaneous distinction. In *Proceedings of the Human Factors and Ergonomics Society 59<sup>th</sup> Annual Meeting* (pp. 289-293). Thousand Oaks, CA: SAGE. (DOI 10.1177/1541931215591059)
- Fisher, C. R., Walsh, M. M., Blaha, L., & Gunzelmann, G. (2015). Comparing ACT-R and the LBA in single detection tasks. In D. C. Noelle, R. Dale, A. S. Warlaumont, J. Yoshimi, T. Matlock, C. D. Jennings, & P. P. Maglio (Eds.), *Proceedings of the 37<sup>th</sup> Annual Meeting of the Cognitive Science Society* (pp. 710-715). Austin, TX: Cognitive Science Society.
- Dancy, C., Ritter, F. E., & Gunzelmann, G. (2015). Two ways to model the effects of sleep fatigue on cognition. In N. Taatgen, M. van Vugt, J. Borst, & K. Mehlhothe (Eds.), *Proceedings of the 13<sup>th</sup> International Conference on Cognitive Modeling* (pp. 258-263). Groningen, The Netherlands: University of Groningen.



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- Gunzelmann, G., Gaughan, C., Huiskamp, W., van den Bosch, K., Alexander, T., de Jong, S., Bruzzone, A. G., & Tremori, A. (2014). In search of interoperability standards for human behavior representations. In *Proceedings of the 2014 Interservice/Industry Training, Simulation, and Education Conference (IITSEC 2014)*. (pp. 2091-2102). Arlington, VA: National Training & Simulation Association.
- Jastrzemski, Stefanidis, D., Gluck, K. A., Krusmark, M. A., & Gunzelmann, G. (2014). Cognitive modeling for surgical skill performance prediction. In *Proceedings of the Human Factors and Ergonomics Society 58<sup>th</sup> Annual Meeting*. Thousand Oaks, CA: SAGE.
- Walsh, M. M., & Gunzelmann, G., & Van Dongen, H. P.A. (2014). Comparing accounts of psychomotor vigilance impairment due to sleep loss. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 877-882). Austin, TX: Cognitive Science Society.
- Gunzelmann, G. (2013). Motivations and goals in developing integrative models of human cognition [Workshop Organizer]. In M. Knauff, M. Pauen, N. Sebanz, & I. Wachsmuth (Eds.), *Proceedings of the 35<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 30-31). Austin, TX: Cognitive Science Society.
- Moore, L. R., & Gunzelmann, G. (2013). The impact of sleep loss on time estimation: Reconciling conflicting results through modeling. In R. West & T. Stewart, *Proceedings of the 12<sup>th</sup> International Conference on Cognitive Modeling* (pp. 191-196). Ottawa, Canada: Carleton University.
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- Dimperio, E., Gunzelmann, G., & Harris, J. (2008). An initial evaluation of a cognitive model of UAV reconnaissance. In J. Hansberger (Ed.), *Proceedings of the 17<sup>th</sup> Conference on Behavior Representation in Modeling and Simulation* (pp. 165-173). Orlando, FL: Simulation Interoperability Standards Organization.
- Gunzelmann, G., & Gluck, K. A. (2008). Approaches to modeling the effects of fatigue on cognitive performance. In J. Hansberger (Ed.), *Proceedings of the 17<sup>th</sup> Conference on Behavior Representation in Modeling and Simulation* (pp. 136-145). Orlando, FL: Simulation Interoperability Standards Organization.
- \*\*Named to the conference “Recommended Reading List”**
- Gunzelmann, G., Moore, L. R., Gluck, K. A., Van Dongen, H. P. A., & Dinges, D. F. (2008). Individual differences in sustained vigilant attention: Insights from computational cognitive modeling. In B. C. Love, K. McRae, & V. M. Sloutsky (Eds.), *Proceedings of the 30<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 2017-2022). Austin, TX: Cognitive Science Society.
- Gunzelmann, G., Pope, A., Wray, R., Best, B. J. & Trafton, J. G. (2008). Integrating cognitive architectures with external environments: Approaches and contributions to validation [Symposium Organizer]. In B. C. Love, K. McRae, & V. M. Sloutsky (Eds.), *Proceedings of the 30<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 913-914). Austin, TX: Cognitive Science Society.
- Gluck, K. A., Scheutz, M., Gunzelmann, G., Harris, J., & Kershner, J. (2007). Combinatorics meets processing power: Large-scale computational resources for BRIMS. In T. Kelley & L. Allender (Eds.), *Proceedings of the 16<sup>th</sup> Conference on Behavior Representation in Modeling and Simulation* (pp. 73-83). Orlando, FL: Simulation Interoperability Standards Organization.
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- Gunzelmann, G., Gluck, K. A., Kershner, J., Van Dongen, H. P. A., & Dinges, D. F. (2007). Understanding decrements in knowledge access resulting from increased fatigue. In D. S. McNamara and J. G. Trafton (Eds.), *Proceedings of the 29<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 329-334). Austin, TX: Cognitive Science Society.
- \*\*Computational Modeling Prize for Applied Cognition**
- Gunzelmann, G., & Lyon, D. R. (2007). Cognitive architectures: Valid control mechanisms for spatial information processing. In H. Schultheis, T. Barkowsky, B. Kuipers, and B. Hommel (Eds.), *Technical Report #SS-07-01: AAI Spring Symposium Series: Control Mechanisms for Spatial Knowledge Processing in Cognitive/Intelligent Systems* (pp. 23-28). Menlo Park, CA: AAI Press.
- Gluck, K. A., Gunzelmann, G., Gratch, J., Hudlicka, E., & Ritter, F. E. (2006). The impact of cognitive moderators on human cognition & performance [Symposium co-organizer, with K. A. Gluck]. Symposium abstract in R. Sun & N. Miyake (Eds.), *Proceedings of the 28<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 2658). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gross, J. B., Gunzelmann, G., Gluck, K. A., Van Dongen, H. P. A., & Dinges, D. F. (2006). Prediction of circadian performance during sleep deprivation. In R. Sun & N. Miyake (Eds.), *Proceedings of*

*the 28<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 297-302). Mahwah, NJ: Lawrence Erlbaum Associates.

Gunzelmann, G. (2006). Understanding similarities in performance on different orientation tasks: strategy adaptation. In D. Fum, F. Del Missier & A. Stocco (Eds.), *Proceedings of the 7<sup>th</sup> International Conference on Cognitive Modeling* (pp. 124-129). Trieste, Italy: Edizioni Goliardiche.

Gunzelmann, G., & Lyon, D. R. (2006). Qualitative and quantitative reasoning and instance-based learning in spatial orientation. In R. Sun & N. Miyake (Eds.), *Proceedings of the 28<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 303-308). Mahwah, NJ: Lawrence Erlbaum Associates.

Jastrzemski, T. S., Gluck, K. A., & Gunzelmann, G. (2006). Knowledge tracing and prediction of future trainee performance. In *Proceedings of the 2006 Interservice/Industry Training, Simulation, and Education Conference (IITSEC 2006)* (pp. 1498-1508). Orlando, FL: National Training Systems Association.

**\*\*Best Paper Award**

Jastrzemski, T. S., Gluck, K. A., & Gunzelmann, G. (2006). Mathematical models of spacing effects in memory: Applications in education and training. In *Proceedings of the Society for Mathematical Psychology Annual Meeting*. Vancouver, Canada.

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Gunzelmann, G., & Anderson, J. R. (2004). Spatial orientation using map displays: A model of the influence of target location. In K. Forbus, D. Gentner, and T. Regier (Eds.), *Proceedings of the 26<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 517-522). Mahwah, NJ: Lawrence Erlbaum Associates.

Gunzelmann, G., & Anderson, J. R. (2002). Strategic differences in the coordination of different views of space. In W. D. Gray and C. D. Schunn (Eds.), *Proceedings of the 24<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 387-392). Mahwah, NJ: Lawrence Erlbaum Associates.

**\*\*Finalist, Marr Prize for the Best Student Paper**

Gunzelmann, G., & Anderson, J. R. (2001). An ACT-R model of the evolution of strategy use and problem difficulty. In E. M. Altman, A. Cleeremans, C. D. Schunn, and W. D. Gray, *Proceedings of the 4<sup>th</sup> International Conference on Cognitive Modeling* (pp. 109-114). Mahwah, NJ: Lawrence Erlbaum Associates.

*Lightly Reviewed Conference Papers & Abstracts (40 Total)*

Morris, M. B., Veksler, B. V., Gaines, A. R., Krusmark, M. A., Jantscher, H., & Gunzelmann, G. (2020). Aircrew sleep schedules: A comparison of actual and prescriptive schedules. In *Proceedings of the Aerospace Medical Association's 90<sup>th</sup> Annual Scientific Meeting* (Atlanta, GA).

**\*\*Endorsed for Scientific Merit by the Aerospace Human Factors Association**

**\*\*Event Cancelled\*\***

Gunzelmann, G., Morris, M. B., Veksler, B. Z., & Gaines, A. R. (2019). Planned versus Executed Sleep and Activity Profiles in Air Force Mobility Operations. In H. P. A. Van Dongen and K. Honn (Eds.), *Proceedings of the 24<sup>th</sup> International Symposium on Shiftwork and Working Time*. Coeur d'Alene, ID.

- Houpt, J., Fisher, C., & Gunzelmann, G. (2019). Fundamental tools for deriving likelihood functions for ACT-R models. In *Proceedings of the 52<sup>nd</sup> Annual Meeting of the Society for Mathematical Psychology*. Montreal, Canada: Society for Mathematical Psychology.
- Gains, A. R., Morris, M. B., & Gunzelmann, G. (2019). Analyses of fatigue-related USAF aviation mishaps. In *Proceedings of the Aerospace Medical Association's 90<sup>th</sup> Annual Scientific Meeting* (Las Vegas, NV).  
**\*\*Runner Up, 2019 Jeff Myers Young Investigators Award, sponsored by the Space Medicine Association of the Aerospace Medical Association**
- Morris, M., Howland, J., Amaddio, K., & Gunzelmann, G. (2019). Airman fatigue perceptions and strategies. In *Proceedings of the 20<sup>th</sup> International Symposium on Aviation Psychology* (Dayton, OH).
- Gunzelmann, G., Myers, C. M., & Stevens, C. (2018). Interactions between physiology and cognition in models of the mind. In *Proceedings of the AAAI Fall Symposium Series: A Common Model of Cognition*. Washington, DC: AAAI.
- Jastrzemski, T. S., Gluck, K. A., Krusmark, M. A., Kardong-Edgren, S., Oermann, M., Gunzelmann, G., Harris, J., & Griffin, R. (2018). Comparison of performance for RQI CPR training with and without dynamic feedback: Implications for skill measurement, system design, and certification policy. In *Proceedings of the American Heart Association's Scientific Sessions 2018* (Chicago, IL).
- Veksler, B., & Gunzelmann, G. (2017). Commonalities in mechanisms responsible for vigilance and sleep deprivation effects. In *Proceedings of the 8<sup>th</sup> International Conference on Applied Human Factors and Ergonomics*. Los Angeles, CA: AHFE International.
- Walsh, M. M., Blaha, L., Fisher, C., Gunzelmann, G., Setlur, V., & Veksler, B. (2017). The use of computational cognitive models to support real-time state assessment. In *Proceedings of the 8<sup>th</sup> International Conference on Applied Human Factors and Ergonomics*. Los Angeles, CA: AHFE International.
- Gearhart, J. M., Myers, C., Covington, T., Fisher, C., Hassan, R., & Gunzelmann, G. (2017). Integration of physiology and cognitive models to predict human behavioral outcomes in aeronautical environments. In *Proceedings of the Annual Meeting of the Aerospace Medical Association*.
- Gunzelmann, G., Fisher, C., Walsh, M. M., & Blaha, L. (2017). Real-time cognitive model based fatigue monitoring. In *Proceedings of the Annual Meeting of the Aerospace Medical Association*.
- Jastrzemski, T. S., Walsh, M., Krusmark, M. A., Kardong-Edgren, S., Oermann, M., Wilson, H., Gluck, K. A., Gunzelmann, G., Harris, J., Lacroix, D., Koshinskie, R., Dufour, K. M., & Millwater, T. L. (2017). Personalized medical training to sustain competence through use of a cognitive model. In *Proceedings of the 17th International Meeting on Simulation in Healthcare (IMSH 2017)*. Orlando, FL.
- Fisher, C. R., Blaha, L. M., Walsh, M. M., Veksler, B. Z., & Gunzelmann, G. (2016). The pre-computed distributed look-up table method for real-time parameter estimation. In *Abstract Book: 49<sup>th</sup> Annual Meeting of the Society for Mathematical Psychology* (p. 59). Society for Mathematical Psychology.
- Gunzelmann, G. (2016). Mathematical-computational symbiosis: Integration and convergence in theories of human cognition [Symposium Presenter]. In *Abstract Book: 49<sup>th</sup> Annual Meeting of the Society for Mathematical Psychology* (p. 15). Society for Mathematical Psychology.
- Fisher, C. R., Walsh, M. M., Blaha, L., & Gunzelmann, G. (2015). Extending the linear ballistic accumulator to the Psychomotor Vigilance Task. In J. Vandekerckhove & J. Trueblood, *Proceedings of the 48<sup>th</sup> Annual Meeting of the Society of Mathematical Psychology* (p. 4539). Society for Mathematical Psychology.
- Gunzelmann, G. (2015). Applications of computational modeling to fatigue risk management in aviation. In *Proceedings of the 18<sup>th</sup> International Symposium on Aviation Psychology*. Dayton, OH: Wright State University.

- Gunzelmann, G. (2015). Simulating the fatigued mind to mitigate risk in the human-machine system. In *Abstracts for the Fatigue Modelling for Complex Environments Workshop*. Oklahoma City, OK.
- Gunzelmann, G., Veksler, B. Z., Walsh, M. M., & Gluck, K. A. (2015). Fatigue risk mitigation in aerospace medicine: Simulating the effects of fatigue on cognitive processing. In *Proceedings of the Annual Meeting of the Aerospace Medical Association*.
- Gunzelmann, G. (2014). Requirements for Predicting the Impact of Fatigue on Human Behavior. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36<sup>th</sup> Annual Conference of the Cognitive Science Society* (pp. 889-890). Austin, TX: Cognitive Science Society.
- Halverson, T., Krusmark, M. A., & Gunzelmann, G. (2014). Differentiating cognitive effects of sleep deprivation with the Digit Symbol Substitution Task. In J. Houpt, L. Blaha, I. Juvina, & A. Miller, *Proceedings of the 4<sup>th</sup> Annual Midwest Cognitive Science Conference* (p. 15). Dayton, OH: Wright State University.
- Jastrzemski, T. S., Krusmark, M.A., Tang, Y., Gluck, K. A., Gunzelmann, G., & Pitt, M. A. (2014). Modeling nuances of the spacing effect. In D. Cousineau, S. Chartier, S. Hélie, & F. Vachon, *Proceedings of the 47<sup>th</sup> Annual Meeting of the Society of Mathematical Psychology* (p. 39). Society for Mathematical Psychology.
- Tang, Y., Jastrzemski, T. S., Krusmark, M.A., Gluck, K. A., Pitt, M. A., & Gunzelmann, G., (2014). Adaptive design optimization for comparing models of the spacing effect. In D. Cousineau, S. Chartier, S. Hélie, & F. Vachon, *Proceedings of the 47<sup>th</sup> Annual Meeting of the Society of Mathematical Psychology* (p. 46). Society for Mathematical Psychology.
- Veksler, B. Z., & Gunzelmann, G. (2014). Cognitive modeling of the vigilance decrement. In J. Houpt, L. Blaha, I. Juvina, & A. Miller, *Proceedings of the 4<sup>th</sup> Annual Midwest Cognitive Science Conference* (p. 23). Dayton, OH: Wright State University.
- Honn, K. A., Halverson, T., Jackson, M. L., Gunzelmann, G., & Van Dongen, H. P. A. (2013). Sleep deprivation and components of cognition in the digit symbol substitution task. Presented at the *27<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies*. Baltimore, MD: APSS.
- Veksler, B. Z., & Gunzelmann, G. (2013). Modeling the vigilance decrement in the Mackworth clock task. In D. N. Cassenti (Ed.), *Proceedings of the 22<sup>nd</sup> Annual Conference on Behavior Representation in Modeling and Simulation (BRIMS)*. San Antonio, TX: BRIMS.
- Gunzelmann, G., Mohebbi, R. (2010). Spatial encoding in briefly presented schematic displays [Abstract]. In *Poster Book: Association for Psychological Science 22<sup>nd</sup> Annual Convention*. (p. 179). Washington, DC: Association for Psychological Science.
- Gluck, K. A., Gunzelmann, G., & Krusmark, M. A. (2009). Do the details matter? Comparing performance forecasts from two computational theories of fatigue. In A. Howes, D. Peebles, & R. Cooper (Eds.), *Proceedings of the 9<sup>th</sup> International Conference on Cognitive Modeling*. Manchester, UK: University of Manchester.
- Lyon, D. R., & Gunzelmann, G. (2009). Visualizing egocentric paths: A computational model. In A. Howes, D. Peebles, & R. Cooper (Eds.), *Proceedings of the 9<sup>th</sup> International Conference on Cognitive Modeling*. Manchester, UK: University of Manchester.
- Best, B. J., Fincham, J., Gluck, K. A., Gunzelmann, G., & Krusmark, M. (2008). Efficient use of large-scale computational resources. In J. Hansberger (Ed.), *Proceedings of the 17<sup>th</sup> Conference on Behavior Representation in Modeling and Simulation* (pp. 180-181). Orlando, FL: Simulation Interoperability Standards Organization.
- Gunzelmann, G., Douglass, S., Khooshabeh, P. (2008). Learning to orient using a map display: Evidence from eye tracking. In C. Holscher (Ed.), *Spatial Cognition 2008: Poster Proceedings* (Report #016-08/y2008, pp. 85-88). Bremen, Germany: Transregional Collaborative Research Center SFB/TR 8 Spatial Cognition.
- Moore, L. R., Gunzelmann, G., & Gluck, K. A. (2008). Evaluating mechanisms of fatigue using a digit symbol substitution task [Abstract]. In B. C. Love, K. McRae, & V. M. Sloutsky (Eds.),

*Proceedings of the 30<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 1522). Austin, TX: Cognitive Science Society.

- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2007). Visualizing egocentric vs. exocentric path descriptions. In D. S. McNamara and J. G. Trafton (Eds.), *Proceedings of the 29<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 1811). Austin, TX: Cognitive Science Society.
- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2006). Key components of spatial visualization capacity. In D. Fum, F. Del Missier & A. Stocco (Eds.), *Proceedings of the 7<sup>th</sup> International Conference on Cognitive Modeling* (pp. 381-382). Trieste, Italy: Edizioni Goliardiche.
- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2006). Virtual travel does not enhance spatial working memory for landmark-free paths. In R. Sun & N. Miyake (Eds.), *Proceedings of the 28<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 2550). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gluck, K. A., Ball, J. T., Gunzelmann, G., Krusmark, M. A., Lyon, D. R., & Cooke, N. J. (2005). A prospective look at a synthetic teammate for UAV applications. In *Proceedings of the American Institute of Aeronautics and Astronautics Infotech@Aerospace Conference*. Reston, VA: American Institute of Aeronautics and Astronautics.
- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2005). Spatial visualization in two vs. three dimensions. In B. G. Bara, L. Barsalou, and M. Bucciarelli (Eds.), *Proceedings of the 27<sup>th</sup> Annual Conference of the Cognitive Science Society* (p. 2519). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gunzelmann, G., & Gluck, K. A. (2004). Knowledge tracing for complex training applications: Beyond Bayesian mastery estimates. In K. A. Gluck (Ed.), *Proceedings of the 30<sup>th</sup> Conference on Behavior Representation in Modeling and Simulation* (pp. 383-384). Orlando, FL: Simulation Interoperability Standards Organization.
- Lyon, D. R., Gunzelmann, G., & Gluck, K. A. (2004). Emulating a visuospatial memory field using ACT-R. In M. Lovett, C. Schunn, C. Lebiere, and P. Munro, *Proceedings of the 6<sup>th</sup> International Conference on Cognitive Modeling* (pp. 368-369). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gunzelmann, G., & Anderson, J. R. (2000). Strategies and subgoals: Planning and execution in the Tower of Hanoi [Abstract]. *Abstracts of the Psychonomics Society*, 5, 42.
- Gunzelmann, G., & Blessing, S. B. (2000). Why are some problems easy? New insights into the Tower of Hanoi. In L. R. Gleitman and A. K. Joshi (Eds.), *Proceedings of the 22<sup>nd</sup> Annual Conference of the Cognitive Science Society* (p. 1029). Mahwah, NJ: Lawrence Erlbaum Associates.

### Popular Press Coverage

- Bedi, S. (2019). Air Force studies fatigue, sleep to enhance readiness. *Dayton Daily News*, Friday, 3 Jan 2020. Retrieved from <https://www.daytondailynews.com/news/local/air-force-studies-fatigue-sleep-enhance-readiness/sVsxPy1HzpobCb6r8p2FL/> (7 Jan 2020).
- Pawlyk, O. (2019). The Air Force Is Studying Ways to Help Airmen Sleep Better. *Military.com*. Retrieved from <https://www.military.com/daily-news/2019/12/31/air-force-studying-ways-help-airmen-sleep-better.html> (7 Jan 2020).
- Gaffney, T. R. (2006). Area effort needed to build military med hub. *Dayton Daily News*, Saturday, 24 June 2006, p. A10 (Business).

### **Presentations (1st Author only)**

#### Invited Presentations (28 Total)

- Gunzelmann, G. (2018, September). Enhancing Risk Management with Models of Cognition Under Pressure. Presented at the *Air Mobility Command Safety Conference*. Fairview Heights, IL.
- Gunzelmann, G. (2018, January). Enhancing Risk Management with Computational Models of Cognitive-Physiological Interactions. Presented at the *Wright State University Psychology Department Brown Bag*. Fairborn, OH.

- Gunzelmann, G. (2015, November). Simulating the fatigued mind to mitigate risk in the human-machine system. Presented to the *George Mason University Department of Psychology*. Fairfax, VA.
- Gunzelmann, G. (2015, February). Integrating theories to understand the nature of the human mind. Presented to the *Tufts University Cognitive Science Program*. Boston, MA.
- Gunzelmann, G. (2015, January). The impact of fatigue on cognitive performance: A scientific problem with “too much practical importance.” Presented to the *New Mexico State University Department of Psychology*. Las Cruces, NM.
- Gunzelmann, G. (2014, September). Cognitive Modeling Approaches. Presented at the *United States/India Workshop on Cognitive Science and Autonomy*. New Delhi, India.
- Gunzelmann, G. (2014, March). Computational cognitive modeling. Presented to *DSO Singapore*. Singapore.
- Gunzelmann, G. (2014, March). Training and computational modeling. Presented at the *United States/Singapore Human Systems Workshop*. Singapore.
- Gunzelmann, G. (2013, November). Integrative Theories and Fatigue: Personal Hygiene in Pasteur’s Quadrant. Presented to the *Georgia Institute of Technology, School of Psychology*. Atlanta, GA.
- Gunzelmann, G. (2013, January). Simulating the consequences of fatigue on cognition. Presented to the *Federal Aviation Administration, Fatigue Risk Management Office*. Washington, DC (via video teleconference).
- Gunzelmann, G. (2012, August). Simulating the consequences of fatigue on human cognition and performance. Presented to *SINAPSE: Singapore Institute for Neurotechnology Colloquium Series*. Singapore.
- Gunzelmann, G. (2012, January). Computational models of fatigue. Presented to the *Office of Naval Research*. Arlington, VA.
- Gunzelmann, G. (2011, October). Understanding fatigue using a cognitive architecture. Presented to the *Naval Submarine Medical Research Laboratory*. Groton, CT.
- Gunzelmann, G. (2011, March). Cognitive science research in AFRL for more adaptive models of human cognition. Presented to the *Ohio State University, Psychology Colloquium*. Columbus, OH.
- Gunzelmann, G. (2010, November). Cognitive models and agents. Presented to the *University of Dayton Research Institute*. Dayton, OH.
- Gunzelmann, G. (2010, May). Understanding and simulating the impact of fatigue using computational modeling. Presented to the *Department of Defense Human Factors Engineering Technical Advisory Group*. Tempe, AZ.
- Gunzelmann, G. (2009, October). Predicting the performance of tired drivers. Presented to the *University at Texas at Austin Psychology Department*. Austin, TX.
- Gunzelmann, G. (2009, September). Foundational mechanisms for applied cognitive science. Presented to the *Arizona State University Graduate Seminar in Psychology*. Tempe, AZ.
- Gunzelmann, G. (2008, March). Addressing applied problems with basic research. Presented to the *Cognitive Engineering Research Institute/Arizona State University Polytechnic Campus Applied Psychology Brown Bag*. Mesa, AZ.
- Gunzelmann, G. (2006, February). Accounting for the cognitive & behavioral effects of sleep loss. Presented to the *Division of Sleep and Chronobiology at the University of Pennsylvania Medical School*. Philadelphia, PA.
- Gunzelmann, G. (2006, February). Identifying & validating mechanisms for fatigue in a cognitive architecture. Presented to the *Division of Sleep Medicine at Brigham and Women’s Hospital and Harvard Medical School*. Boston, MA.
- Gunzelmann, G. (2006, January). Predicting the effects of sleep loss using a cognitive architecture. Presented to the *Sleep and Performance Research Center at Washington State University*. Spokane, WA.

- Gunzelmann, G. (2005, September). Representing fatigue in a cognitive architecture: integrations. Presentation to the *Air Force Research Laboratory's Fatigue Countermeasures Branch*. San Antonio, TX.
- Gunzelmann, G. (2004, February). Spatial transformations: Influences on difficulty. Presented to the *George Mason University, Human Factors/Applied Cognition Colloquium*. Fairfax, VA.
- Gunzelmann, G. (2004, February). Spatial transformations: Influences on difficulty. Presented to the *University of North Florida, Department of Psychology*. Jacksonville, FL.
- Gunzelmann, G. (2003, December). Spatial transformations: Influences on difficulty. Presented to the *Arizona State University's Polytechnic Campus Applied Psychology Brown Bag Series*. Mesa, AZ.
- Gunzelmann, G. (2003, March). Orientation tasks involving the integration of multiple perspectives. Presented to the *Florida Atlantic University, Department of Psychology*. Boca Raton, FL.
- Gunzelmann, G. (2003, March). Orientation tasks involving the integration of multiple perspectives. Presented to the *University of North Florida, Department of Psychology*. Jacksonville, FL.

Conference & Workshop Presentations (No Proceedings; 30 Total)

- Gunzelmann, G. (2019, April). Personalized Education, Assessment, & Training. Presented at the *NDIA Human Systems Conference*. Aberdeen Proving Grounds, MD.
- Gunzelmann, G. (2018, March). Personalized Education, Assessment, & Training. Presented at the *NDIA Human Systems Conference*. Springfield, VA.
- Gunzelmann, G. (2017, March). Personalized Education, Assessment, & Training. Presented at the *NDIA Human Systems Conference*. Springfield, VA.
- Gunzelmann, G. (2016, July). The fatigue module: Unusual, but necessary. Presented at the *23<sup>rd</sup> Annual ACT-R Workshop*. Lancaster, PA.
- Gunzelmann, G., Bennett, W., & Wilson, C. (2016, May). GIFT adoption implications for adaptive training design and development. Presented at the *Generalized Intelligent Framework for Tutoring (GIFT) 5<sup>th</sup> Expert Panel Workshop: Learning and Assessment Strategies*. Princeton, NJ.
- Gunzelmann, G. (2015, April). Unified theories of cognition: (Still) a vision for cognitive modeling? Symposium presenter at the *13<sup>th</sup> International Conference on Cognitive Modeling*. Groningen, The Netherlands.
- Gunzelmann, G. (2014, August). What is the role of cognitive science for theories of general intelligence? Presented at the *7<sup>th</sup> Conference on Artificial General Intelligence*. Quebec City, Canada.
- Gunzelmann, G. (2014, July). Cognitive moderators: Methodologies for turning the fantasy of unified theories into reality. Presented at the *21<sup>st</sup> Annual ACT-R Workshop*. Quebec City, Canada.
- Gunzelmann, G. (2013, July). Personal hygiene and integrated models of human cognition. Presented at the *Workshop on Integrated Models of Human Cognition* (in conjunction with CogSci 2013). Berlin, Germany.
- Kurup, U., Byrne, M. D., Gunzelmann, G., Lewis, C., Salvucci, D. & Taatgen, N. (2012, July). Cognitive architectures: State, trends, and roadmap. Symposium presenter at the *19<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G. (2011, July). Comprehensiveness, scale, & integration. Presented at the *18<sup>th</sup> Annual ACT-R Workshop*. North Conway, NH.
- Gunzelmann, G. (2011, April). Changes in cognitive processing resulting from sleep loss. *2<sup>nd</sup> U.S. – Singapore Cognitive Neurosciences Workshop*. Arlington, VA.
- Gunzelmann, G. (2010, September). Modeling the impact of fatigue on cognitive processing. Presented at the *Inaugural Meeting of the Center of Excellence in Neuroergonomics, Technology, and Cognition (CENTEC)*. Fairfax, VA.
- Gunzelmann, G., & Moore, L. R. (2009, July). Making models tired: A module for fatigue. Presented at the *16<sup>th</sup> Annual ACT-R Workshop*. Amsterdam, The Netherlands.



- Gunzelmann, G. (2009, June). A case study in predicting the impact of fatigue on real world performance. Presented at the *Workshop on Components of Cognition and Fatigue: From Laboratory Experiments to Mathematical Modeling and Operational Applications*. Spokane, WA.
- Gunzelmann, G. (2009, May). Where can we find an integrated theory of human spatial competence? (And what would we do with it?). Presented at the *Modeling Spatial Cognition Workshop*. Scottsdale, AZ.
- Gunzelmann, G. (2009, May). Fatigue in sustained attention: Generalizing mechanisms for time awake to time on task. Presented at the *Workshop on the Current Status and Future for Research and Applications on Cognitive Fatigue*. Atlanta, GA.
- Gunzelmann, G. (2009, March). Diagrammatic reasoning in the context of human spatial competence. Panel presenter, Diagrammatic Representations and Cognitive Architectures. Symposium presenter at the *17th Conference on Behavior Representation in Modeling and Simulation*. Sundance Ranch, UT.
- Gunzelmann, G. (2008, August). Spatial aspects of unmanned aerial vehicle reconnaissance: A computational cognitive modeling approach. Symposium presenter, APA Division 21 symposium on Applying Spatial Cognition to Complex Tasks and Tools. Presented at the *American Psychological Association's 116<sup>th</sup> Annual Convention*. Boston, MA.
- Gunzelmann, G. (2008, July). Confronting architectural drift in ACT-R. Presented at the *15<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G. (2008, July). Scientific progress enabled through the use of large scale computing resources. Presented at the *15<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G., & Gluck, K. A. (2006, October). Modeling fatigue in a cognitive architecture: What is the value added? Presented at the *Workshop on New Approaches to Modeling Sleep/Wake Dynamics and Cognitive Performance*. Columbus, OH.
- Gunzelmann, G. (2006, August). Incorporating mechanisms for fatigue into a cognitive architecture. Presented at the *Joint SIAM-SMB Conference on the Life Sciences (Society for Industrial and Applied Mathematics and the Society for Mathematical Biology)*. Raleigh, NC.
- Gunzelmann, G., Gluck, K. A., & Kershner, J. (2006, July). Parameter space exploration using high performance computing. Presented at the *13<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G. (2006, July). Representing human spatial competence in ACT-R. Presented at the *13<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G., & Gluck, K. A. (2005, July). Spatial orientation in ACT-R: Architectural insights and extensions. Presented at the *12<sup>th</sup> Annual ACT-R Workshop*. Trieste, Italy.
- Gunzelmann, G. (2005, June). Predicting the impact of fatigue: Individual differences and environmental influences. Presented at the *Air Force Research Laboratory Human Effectiveness Directorate and Air Force Office of Scientific Research Workshop*. Dayton, OH.
- Gunzelmann, G., & Anderson, J. R. (2002, July). Strategies and performance in an orientation task. Presented at the *9<sup>th</sup> Annual ACT-R Workshop*. Pittsburgh, PA.
- Gunzelmann, G., & Blessing, S. B. (1998, April). A tale of three isomorphs: Transfer in the Tower of Hanoi. Poster presented at the *11<sup>th</sup> Annual Florida Cognition Conference*. Miami, FL.
- Gunzelmann, G., & Snyder, P. A. (1997, May). Reactions to failure in gifted students: physiological and performance-related responses. Poster presented at the *Annual Meeting of the Eastern Psychological Association*. Washington, DC.

### **Teaching Interests**

Cognitive Psychology/Cognitive Science  
 Cognitive Modeling  
 Human Factors  
 High-Level Cognition (e.g., Problem Solving, Reasoning, Decision-Making)  
 Research Methods

Introductory Psychology

## **Teaching Experience**

### Courses Taught

Arizona State University

Spring 2008/2009/2010/2011 – Memory & Cognition (Enrollment: 20/11/22/14)

Fall 2005/2006 – Introduction to Cognitive Science (Enrollment: 13/9)

University of Florida

Summer 1999 – Lecture Course in Cognitive Psychology (Enrollment: 59)

Summer 1998 – Laboratory Course in Cognitive Psychology (Enrollment: 16)

### Teaching Assistantships

Carnegie Mellon University

Human Information Processing and Artificial Intelligence (Fall 2001; Fall 2000)

Cognitive Psychology (Spring 2000)

University of Florida

Lecture Course in Cognitive Psychology (Spring, 1999)

Introductory Psychology (Fall 1998)

Laboratory Course in Cognitive Psychology (Spring 1998; Fall 1997)

Albright College

Cognitive Psychology (Fall 1996)

Research Design & Methodology (Spring 1996)

Experimental Psychology (Fall 1995)

## **Professional Activities**

### Conference, Workshop, & Symposium Organization

Annual Meeting of the Cognitive Science Society (CogSci)

Conference Co-Chair, with A. Howes, T. Tenbrink, & E. Davelaar (39<sup>th</sup> Annual Meeting, Summer 2017)

Cognition for Human Performance and Autonomous Systems Workshop (25-26 May, 2016)

Workshop Co-Organizer, with K. A. Gluck

Unified Theories of Cognition: Newell's Vision after 25 Years (11 April, 2015, at the *13<sup>th</sup> International Conference on Cognitive Modeling*)

Symposium Organizer

Special Session on Artificial General Intelligence and Cognitive Science (1 August, 2014, at the *Artificial General Intelligence Conference*)

Session Co-Organizer (with J. Bach)

Information available: <http://agi.conf.org/2014/workshop-on-agi-and-cognitive-science/>

Motivations and Goals in Developing Integrative Models of Human Cognition (31 July, 2013, at the *Annual Meeting of the Cognitive Science Society*)

Information available: <http://imhc.mindmodeling.org/>

Workshop Organizer

International Conference on Cognitive Modeling (ICCM)

Steering Committee (2010-PRES)

Conference Co-Chair, with D. D. Salvucci – 10<sup>th</sup> ICCM (August 2010)

Information available: <http://iccm-conference.org/2010/>

Modeling Spatial Cognition Workshop (14-16 May, 2009)

Workshop Organizer

Integrating Cognitive Architectures with External Environments: Approaches and Contributions to Validation (26 July, 2008, at the *Annual Meeting of the Cognitive Science Society*)

Curriculum Vitae (Oct 2020)

Glenn Gunzelmann

## Symposium Organizer

The Impact of Cognitive Moderators on Human Cognition & Performance (29 July, 2006, at the *Annual Meeting of the Cognitive Science Society*)  
Symposium Co-Organizer (with K. A. Gluck)

## Conference/Workshop Committees

American Association for Artificial Intelligence Fall Symposium Series  
Program Committee, Integrated Cognition (2013)

Annual Meeting of the Cognitive Science Society  
Program Committee – 29<sup>th</sup> – 36<sup>th</sup>; 38<sup>th</sup>; 40<sup>th</sup> Annual Meetings (2007-2014; 2016; 2018)  
Tutorial/Workshop Committee Chair – 34<sup>th</sup> Annual Meeting (2012)  
Student Volunteer Chair – 31<sup>st</sup> – 33<sup>rd</sup> and Annual Meetings (2009-2011)  
Tutorial/Workshop Program Committee – 28<sup>th</sup> – 31<sup>st</sup> Annual Meetings (2006-2009)  
Symposium Committee Chair – 28<sup>th</sup> – 30<sup>th</sup> Annual Meetings (2006-2008)

International Conference on Cognitive Modeling (ICCM)  
Program Committee – 7<sup>th</sup> – 9<sup>th</sup>; 11<sup>th</sup> – 12<sup>th</sup> ICCM (April 2006; July 2007; July 2009; April 2012; July 2013)  
Student Volunteer Chair – 6<sup>th</sup> ICCM (July, 2004)  
Tutorials Committee – 6<sup>th</sup> – 9<sup>th</sup> ICCM (July 2004; April 2006; July 2007; July 2009)  
Best Paper Award Committee – 13<sup>th</sup> ICCM (2015)

Interservice/Industry Training, Simulation, & Education Conference (I/ITSEC)  
Simulation Subcommittee (2007-2008)

## Editorial Activities

Associate Editor, *Topics in Cognitive Science (TopiCS)*: 2009-2012

## Ad Hoc Reviewing Activities

**Funding Agencies:** Air Force Office of Scientific Research (AFOSR); National Science Foundation (NSF); National Security and Science and Engineering Faculty Fellowship Program (NSSEFF); Office of Naval Research (ONR)

**Publishers:** Oxford University Press

**Journals:** Acta Astronautica; Behavior Research Methods; Behavioral and Brain Sciences; Cerebral Cortex; Cognitive Science; Cognitive Systems Research; Computational Intelligence and Neuroscience; Human-Computer Interaction; Human Factors; IEEE Transactions on Human-Machine Systems; International Journal of Human-Computer Studies; Journal of Mathematical Psychology; Journal of Sleep Research; Memory & Cognition; Neural Computing and Applications; Psychological Review; Psychonomic Bulletin & Review; Quarterly Journal of Experimental Psychology; Simulation Modelling Practice and Theory; Sleep; Spatial Cognition & Computation; Topics in Cognitive Science; Trends in Cognitive Sciences; Transportation Research Part F: Traffic Psychology and Behaviour

**Conferences:** Annual Meeting of the Cognitive Science Society; Annual Meeting of the Human Factors and Ergonomics Society; Behavior Representations in Modeling and Simulation (BRIMS); Computer-Human Interaction Conference (CHI); Conference on Human-Robot Interaction (HRI); European Cognitive Science Conference (EuroCogSci); International Conference on Cognitive Modeling (ICCM); Spatial Cognition

## Memberships

Cognitive Science Society: 2000-Present

APS: Association for Psychological Science: 2003-Present (Fellow, since 2020)

Psychonomic Society: 2011-Present (Fellow, since 2014)

Phi Kappa Phi: Inducted 1997

PsyChi – Psychology National Honor Society: Inducted 1995

American Psychological Association of Graduate Students & Pennsylvania Psychological Association  
Graduate Student Campus Representative (Carnegie Mellon University): 2001-2003