

Michael W. Boyce, Ph.D.

Human Factors Psychologist · Instructions & Warnings · Power Mobility & Assistive Device Controls · Use-Error Analysis

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Updated November 2026

PROFESSIONAL SUMMARY

Human factors psychologist (Ph.D., 2014) with 12 years of applied research and usability practice since the doctorate, in healthcare, federal human-systems integration, and defense research. Research on how people with disabilities and older adults use mobility and assistive devices: doctoral dissertation and a 2017 Applied Ergonomics article on instruction design for emergency evacuation devices; published work on adaptive driving controls and gesture-based wheelchair control; master's project on eye-gaze drive control for power wheelchairs. Member and secretary of the RESNA standards committee on emergency stair travel devices (2012–2013). Power wheelchair user. UX Master Certified (Nielsen Norman Group).

CORE COMPETENCIES

Instruction & Warning Design · Use-Error & Root Cause Analysis · Power Mobility & Alternative Drive Controls · Assistive Technology · Accessibility & Inclusive Design · Usability Testing & Final-Design Evaluation · Task Analysis & Workflow Mapping · Study Design & Data Collection · Human-Systems Integration · Statistical Analysis (R, SPSS) · Psychometrics & Validity Analysis · Wearable Physiology (HRV, EDA) · IRB Protocol Design

PROFESSIONAL EXPERIENCE

U.S. Department of Veterans Affairs Feb 2024 – Present
Veterans Health Administration, Human Systems Integration Division (Remote)
Engineering Psychologist

- Lead human-systems-integration and training-effectiveness evaluation for VHA digital health and clinical-informatics systems.
- Develop usability and human-factors guidance, evaluation frameworks, and training-effectiveness checklists used across program teams.

Boyce Human Performance, LLC Jan 2024 – Present
Shelton, CT
Owner and Principal Human Factors Consultant

Solo human factors consulting practice. Engagements:

Yale School of Medicine — Department of Pediatrics 2026 – Present
Psychometric & Human Factors Consultant

- Psychometric and validity analysis for a funded pediatric cardiac-arrest simulation assessment study — comparing screen-based simulation data capture with video review and paper-checklist scoring.

EXPERT NOT RETAINED

University of Illinois Urbana-Champaign — RERC TechSAge Aug 2025 – Present
Statistician / Research Design Consultant / Usability Subject-Matter Expert

- Statistical and research-design consultant to the NIDILRR-funded Rehabilitation Engineering Research Center on Technologies to Support Aging with Long-Term Disabilities (Grant #90REGE0021).
- SME on usability evaluation with people aging with vision, hearing, and mobility disabilities — informing user-centered design of accessible technology across UIUC, Georgia Tech, and Georgia State University.
- Statistical analysis for the Tele Tai Chi clinical trial (Healthcare, 2026); needs-assessment design for aging-with-disability research.

Acuity Behavioral Health (Remote) Jan 2024 – Dec 2025
Data Analyst / Human Factors Engineer

- Worked with an interdisciplinary team of engineers, computer scientists, and clinicians on a multi-site behavioral health assessment study including Yale Psychiatric Hospital.
- Designed protocols, managed end-to-end research execution, and produced weekly analytic reporting with root cause analysis to inform design and operational decisions.
- Co-author and contributing HF designer on NEAT (Nurse Effort Assessment Tool) — peer-reviewed publication (Good, Boyce et al., 2024, Proc. HFES) delivered through Boyce Human Performance LLC engagement with Acuity Behavioral Health, in collaboration with Yale colleagues.

Yale New Haven Health Jun 2023 – Feb 2024
Yale Center for Healthcare Simulation, New Haven, CT
Human Factors Engineer

- Led HF and ergonomics evaluations across complex healthcare systems, translating findings into safety, workflow, and process improvements.
- Lead author on CDC-funded research optimizing hand-hygiene quality — designed methodology, collected data, performed root cause analysis, and authored published findings (Human Factors in Healthcare, 2024).
- ED clinical-decision-support formative evaluation work; ED simulation-based safety research.

U.S. Army Research Laboratory Aug 2016 – Feb 2023
Later U.S. Army DEVCOM Soldier Center — Orlando, FL / West Point, NY
Research Psychologist

- Managed and conducted HF research spanning AR/VR, human-machine interaction, simulation-based training, and cyberspace warfare training (program-level Best S&T Program award, 2021).
- Led HFE planning, study design, data collection, and reporting for multiple peer-reviewed programs supporting capability development.
- Served as IRB Exempt Determination Official, ARL HRPP (2016–2018).
- Mentored DoD SMART doctoral scholars; advised simulation-based training strategies.

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U.S. Army Research Laboratory / Oak Ridge Associated Universities Feb 2014 – Aug 2016
Postdoctoral Researcher

- Adaptive Intelligent Tutoring Systems (2015–2016) and Human-Robot Interaction / Human-Agent Transparency (2014–2015).

U.S. Department of Homeland Security Dec 2007 – Jan 2014
Science and Technology Directorate
Social Science Trainee (Jun 2011 – Jan 2014) · IT Specialist Intern (Dec 2007 – Jun 2011)

- Student trainee supporting the Human Factors and Behavioral Sciences Division: human factors engineering and human performance studies, including research, development, testing, and evaluation of new technologies and systems.

EDUCATION

Ph.D., Applied/Experimental Human Factors Psychology — University of Central Florida (2014)

M.S., Human-Computer Interaction — Georgia Institute of Technology (2010) — master's project: eye-gaze drive controls for power wheelchairs

B.S., Science, Technology, and Culture — Georgia Institute of Technology (2008)

CERTIFICATIONS AND CLEARANCE

IBM AI Product Manager Professional Certificate — IBM and SkillUp / Coursera (2026)

AI For Business Specialization — The Wharton School, University of Pennsylvania / Coursera (2026)

Certificate, Applied Data Science Program: Leveraging AI for Effective Decision-Making — MIT Professional Education (2025)

Engineering and Technical Management, Practitioner (DAWIA) — Army Acquisition Workforce (2022)

GIAC Security Essentials Certification (GSEC) — GIAC (2022; expired September 2026)

GIAC Information Security Fundamentals (GISF) — GIAC (2022; expired 2026)

UX Master Certification — Nielsen Norman Group (2021)

Security clearance: previously held Top Secret and Secret clearances (not active).

ACADEMIC APPOINTMENT

Affiliate Faculty, Yale School of Medicine, Department of Emergency Medicine (2023 – present)

PROFESSIONAL MEMBERSHIPS

Human Factors and Ergonomics Society (HFES) — Member (2019 – present)

HFES Forensics Professional Technical Group (2026 – present)

HFES Health Care Technical Group (2019 – present)

HFES Age and Ability Technical Group (2019 – present)

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HFES Training Technical Group (2019 – present)

PROFESSIONAL SERVICE

Co-Track Chair, Simulation & Education — HFES International Symposium on Human Factors and Ergonomics in Health Care (2027)

Session Chair, Health Care Technical Group — ASPIRE 2026, 66th HFES International Annual Meeting (2026)

Peer Reviewer — Human Factors in Healthcare (Elsevier), 2026 – present · Acta Psychologica (Elsevier), 2026 – present

Member and Secretary, RESNA Standards Committee on Emergency Stair Travel Devices (2012 – 2013)

HONORS AND AWARDS

Student Paper Award, Augmented Cognition Technical Group, Human Factors and Ergonomics Society (2012)

Rookie Award for Service, Rehabilitation Engineering and Assistive Technology Society of North America (2011)

Presidential Graduate Fellow, University of Central Florida (2010 – 2014)

PUBLICATIONS AND PROCEEDINGS

Listed most recent first. Citation metrics: 1,231 citations · h-index 14 · i10-index 23 (Google Scholar, November 2026).

Journal Articles

1. Mitzner, Remillard, Mumma, **Boyce** (2026). A Virtual Tai Chi Intervention for Older Adults with Mobility Disabilities: Results from a Single-Arm Clinical Trial with the TechSAge Tele Tai Chi Program. *Healthcare 14(12), 1756*.
2. Wong, Nath, Shah, Kumar, Brinker, Faustino, **Boyce**, et al. (2024). Formative evaluation of an emergency department clinical decision support system for agitation symptoms: a study protocol. *BMJ Open 14(2)*.
3. Fults, Gerwin, **Boyce**, Joseph, Wong, Evans (2024). Educational and personal impacts of the COVID-19 pandemic on emergency medicine resident physicians: a qualitative study. *BMC Medical Education 24(1)*.
4. **Boyce**, Mathew, Roberts, Aniskiewicz, Krechevsky, et al. (2024). A human factors engineering approach to improving hand hygiene quality. *Human Factors in Healthcare 6, 100085*.
5. Gerwin, de Oliveira Almeida, **Boyce**, Joseph, Wong, et al. (2024). HRVEST: a novel data solution for using wearable smart technology to measure physiologic stress variables during a randomized clinical trial. *Frontiers in Computer Science 6*.
6. O'Banion, Lewis, **Boyce**, Laughlin, Majkowicz (2023). Use of an augmented reality sand table for satellite remote sensing education. *Journal of Geography in Higher Education 47(4)*.

EXPERT NOT RETAINED

7. **Boyce**, Thomson, Cartwright, Feltner, Stainrod, Flynn, et al. (2022). Enhancing military training using extended reality: A study of military tactics comprehension. *Frontiers in Virtual Reality 3*.
8. Kallberg, Beitelman, Mitsuoka, et al. (including **Boyce**) (2022). The tactical considerations of augmented and mixed reality implementation. *Military Review 662*. Spanish translation also published.
9. O'Banion, Majkowicz, **Boyce**, Wright, Oxendine, et al. (2020). Evaluating immersive visualization technology for use in geospatial science education. *Surveying and Land Information Science 79(1)*.
10. **Boyce**, Rowan, Shorter, Moss, Amburn, Garneau, et al. (2019). The impact of surface projection on military tactics comprehension. *Military Psychology 31(1)*.
11. **Boyce**, Smither, Fisher, Hancock (2017). Design of instructions for evacuating disabled adults. *Applied Ergonomics 58, 48–58*.
12. **Boyce**, Fekety, Smither (2013). Resource consumption and simulator driving performance using adaptive controls. *Assistive Technology 25(3), 158–165*.
13. Ledbetter, Mohamed-Ameen, Oglesby, **Boyce** (2013). Your wait time from this point will be... practices for designing amusement park queues. *Ergonomics in Design 21(2)*.
14. Ledbetter, **Boyce**, Fekety, Sawyer, Smither (2012). Examining the impact of age and multitasking on motorcycle conspicuity. *Work 41(S1)*.

Conference Proceedings and Papers

15. Paull, **Boyce**, Thomas, Roncallo, Banziruk, Bickell, et al. (2026). Implementing the Plan-Do-Study-Act Model of Change on Virtual Reality Simulation Education in the Emergency Department. *Proc. Intl. Symposium on Human Factors and Ergonomics in Health Care 15(1), 185–189.*
16. Vora, Paull, Thomas, Roncallo, Liebhardt, **Boyce**, et al. (2025). Virtual Reality Interprofessional Simulation Education to Improve Teamwork and the Culture of Safety in the Emergency Department. *Proc. Intl. Symposium on Human Factors and Ergonomics in Health Care*.
17. Good, **Boyce**, Evans, Sevilla (2024). NEAT: Nurse Effort Assessment Tool — Human Factors Considerations in Designing for Appropriate Staffing. *Proc. HFES Annual Meeting 68(1), 1680–1684*.
18. Guzman, Deresky, Taylor, Wimmer, Momen, Tossell, et al. (including **Boyce**) (2022). Evaluating mixed reality and tablet technologies in military planning. *IEEE SIEDS*.
19. Schneider, Jerald, Chick, Anderson, Mittal, **Boyce** (2021). Identifying Simulation Requirements to Support CEMA Training. *Simulation Innovation Workshop*.
20. Rockman, O'Shea, Thomson, **Boyce**, Vey, et al. (2020). Assessing Cognitive Load and Usability for CEMA Training Using COBWebS. *Simulation Innovation Workshop*.
21. **Boyce**, Gardony, Shorter, Horner, Stainrod, Flynn, et al. (2019). Characterizing the cognitive impact of tangible augmented reality. *HCI International*.
22. Hale, Campbell, Riley, **Boyce**, Amburn (2019). Augmented reality sandtable (ARES) impacts on learning. *Proc. HFES Annual Meeting 63(1)*.

EXPERT NOT RETAINED

23. Sinatra, Goldberg, **Boyce** (2019). Utilizing the Generalized Intelligent Framework for Tutoring (GIFT) for Human Factors Education. *Proc. HFES Annual Meeting 63(1)*.
24. **Boyce**, Rovira, Rea, Rengel, Emezie, Ackerman, Knott (2019). Trust in Synthetic Training Environments: Applications for Military Soldiers. *IADIS Interfaces and HCI*.
25. Lameier, Reinerman-Jones, Matthews, Biddle, **Boyce** (2018). The Motivational Assessment Tool (MAT) Development and Validation Study. *Intl. Conf. on Augmented Cognition*.
26. Lameier, Reinerman-Jones, Matthews, Biddle, **Boyce** (2018). Motivational assessment tool (MAT): Enabling personalized learning to enhance motivation. *Intl. Conf. on Intelligent Tutoring Systems*.
27. **Boyce**, DeFalco, Davis, Kober, Goldberg (2018). Mitigating skill decay in military instruction and enemy analysis via GIFT. *Intl. Conf. on Augmented Cognition*.
28. Goldberg, **Boyce** (2018). Experiential Intelligent Tutoring: Using the Environment to Contextualize the Didactic. *Intl. Conf. on Augmented Cognition*.
29. Biddle, Lameier, Reinerman-Jones, Matthews, **Boyce** (2018). Personality: A key to Motivating our Learners. *GIFT Users Symposium*.
30. Folsom-Kovarik, **Boyce**, Thomson (2018). Perceptual-cognitive training improves cross-cultural communication in a cadet population. *GIFT Users Symposium*.
31. DeFalco, Davis, **Boyce**, Kober, Goldberg (2018). Towards validating a Mission Command Team Training Model in GIFT for Military Populations. *GIFT Users Symposium*.
32. Goldberg, Davis, Riley, **Boyce** (2017). Adaptive training across simulations in support of a crawl-walk-run model of interaction. *Intl. Conf. on Augmented Cognition*.
33. **Boyce**, Rowan, Baity, Yoshino (2017). Using assessment to provide application in human factors engineering to USMA cadets. *Intl. Conf. on Augmented Cognition*.
34. Folsom-Kovarik, **Boyce** (2017). Developing a pattern recognition structure to tailor mid-lesson feedback. *GIFT Users Symposium*.
35. Brawner, **Boyce** (2017). Establishing ground truth on psychophysiological models for training machine learning algorithms. *Intl. Conf. on Augmented Cognition*.
36. Lameier, Reinerman-Jones, **Boyce**, Biddle (2017). Assessing motivation to individualize reinforcement and reinforcers for an intelligent tutor. *Intl. Conf. on Augmented Cognition*.
37. **Boyce**, Goldberg, Moss (2016). Electrodermal activity analysis for training of military tactics. *Proc. HFES Annual Meeting 60(1)*.
38. **Boyce**, Cruz, Sottilare (2016). Interpretative phenomenological analysis for military tactics instruction. *Advances in Human Factors, Business Management, Training and Education (Springer)*.
39. Sottilare, **Boyce** (2016). Elements of adaptive instruction for training and education. *Intl. Conf. on Augmented Cognition*.
40. Amburn, Goldberg, Chen, Ragusa, **Boyce**, Shorter (2016). Effects of equipment on model development for adaptive marksmanship trainers. *I/ITSEC*.
41. **Boyce** (2016). From Concept to Publication — A Successful Application of Using GIFT from the Ground Up. *GIFT Users Symposium*.

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42. **Boyce**, Chen, Selkowitz, Lakhmani (2015). Effects of agent transparency on operator trust. *ACM/IEEE Intl. Conf. on Human-Robot Interaction*.
43. Selkowitz, Lakhmani, Chen, **Boyce** (2015). The effects of agent transparency on human interaction with an autonomous robotic agent. *Proc. HFES Annual Meeting 59(1)*.
44. Wright, Chen, Barnes, **Boyce** (2015). The effects of information level on human-agent interaction for route planning. *Proc. HFES Annual Meeting 59(1)*.
45. **Boyce**, Sottilare, Goldberg, Amburn (2015). Work Domain Analysis for Ecological Interface Design of Tangible Interfaces. *I/ITSEC*.
46. **Boyce**, Smither (2012). Incorporating Human Systems Integration into the Evacuation of Individuals with Disabilities. *Advances in Human Aspects of Healthcare*.
47. **Boyce**, Hancock (2012). The interpenetration of mind and machine. *Proc. HFES Annual Meeting 56(1)*.
48. **Boyce**, Duma, Hettinger, Malone, Wilson, et al. (2011). Human performance in cybersecurity: a research agenda. *Proc. HFES Annual Meeting 55(1)*.
49. **Boyce**, Mehta, Gilliand, Jackson (2011). RealWheels: Gesture-based wheelchair mobility for brain-computer interfaces. *CSUN 2011 (student paper)*.
50. Nnadi, Fischer, **Boyce**, Nitsche (2008). Effect of dynamic camera control on spatial reasoning in 3D spaces. *ACM SIGGRAPH Symposium on Video Games*.

Book Chapters

51. **Boyce**, Sinatra, Gilbert, Sottilare (2018). Developing the GIFT Event Report Tool to Support Experimentation for Teams. *Design Recommendations for Intelligent Tutoring Systems Vol. 6*.
52. Reinerman-Jones, Lameier, Biddle, **Boyce** (2017). Motivating Individual Difference in an Intelligent Tutoring System. *Design Recommendations for Intelligent Tutoring Systems Vol. 5*.
53. Nye, **Boyce**, Sottilare (2016). Defining the Ill-Defined: From Abstract Principles to Applied Pedagogy. *Design Recommendations for Intelligent Tutoring Systems Vol. 4*.
54. Sottilare, Ososky, **Boyce** (2015). Expanding Authoring Tools to Support Psychomotor Training Beyond the Desktop. *Design Recommendations for Intelligent Tutoring Systems*.

Technical Reports

55. Reinerman-Jones, Lameier, Biddle, **Boyce** (2017). Informing the long-term learner model: motivating the adult learner (Phase 1). *ARL-TR-8160*.
56. **Boyce**, Reyes, Cruz, Amburn, Goldberg, Moss, et al. (2016). Effect of Topography on Learning Military Tactics — Integration of GIFT and ARES. *ARL-TR-7792*.
57. Amburn, Vey, **Boyce**, Mize (2015). The augmented reality sandtable (ARES). *ARL-SR-0340*.
58. **Boyce**, Chen, Selkowitz, Lakhmani (2015). Agent transparency for an autonomous squad member. *U.S. Army Research Laboratory technical report*.
59. Sottilare, Sinatra, **Boyce**, Graesser (2015). Domain Modeling for Adaptive Training and Education in Support of the US Army Learning Model. *ARL-SR-0325*.

EXPERT NOT RETAINED

60. Chen, Procci, **Boyce**, Wright, Garcia, Barnes (2014). Situation awareness-based agent transparency. *ARL-TR-6905*.

Doctoral Dissertation

61. **Boyce** (2014). Assessment of Instructional Presentation for Emergency Evacuation Assistive Technology. *Doctoral dissertation, University of Central Florida*.

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