Michael W. Boyce, Ph.D.

Human Factors Engineer · Accessibility & Inclusive Design · Use-Related Risk Analysis

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PROFESSIONAL SUMMARY

PhD-level human factors engineer with 12 years of usability, human-systems integration, and applied research experience since completing the PhD in 2014, spanning medical device, healthcare, assistive technology, and defense domains. Specializes in use-related risk analysis, the design and adequacy of warnings and instructions, and usability evaluation with diverse user populations — including users with physical, cognitive, and sensory impairments. Published research on power wheelchair and alternative drive controls, adaptive driving controls, and instruction design for evacuating adults with disabilities. Plans and executes formative and summative usability studies and task analyses. Brings a lived-experience perspective as a wheelchair user and an authentic record in assistive technology, federally-funded accessibility research, and healthcare simulation. UX Master Certified (Nielsen Norman Group); PhD, Applied/Experimental Human Factors Psychology.

CORE COMPETENCIES

Use-Related Risk Analysis · Warnings, Labeling & Instructions Design · Assistive Technology & Power Mobility Controls · Accessibility & Inclusive Design · Formative & Summative Usability Testing · Task Analysis & Workflow Mapping · Study Design & Data Collection · Root Cause Analysis · Human-Systems Integration · Statistical Analysis (R, SPSS) · Wearable Physiology (HRV, EDA) · IRB Protocol Design

RELEVANT EXPERIENCE

University of Illinois at Urbana-Champaign — RERC TechSAge (Boyce Human Performance LLC) 2025 – Present
Statistician / Research Design Consultant / Usability Subject-Matter Expert

- Statistical and research-design lead for 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 lead on Tele Tai Chi clinical-trial analysis; needs-assessment design for aging-with-disability research.

Yale School of Medicine — Department of Pediatrics (Boyce Human Performance LLC) 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.

Acuity Behavior Health (Boyce Human Performance LLC, Remote) 2024 – 2025
Data Analyst / Human Factors Engineer

- Led 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.

- Maintained Yale University affiliate faculty appointment, Department of Emergency Medicine.
- 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 Behavior Health, in collaboration with Yale colleagues.

Yale New Haven Health — Yale Center for Healthcare Simulation (New Haven, CT) 2023 – 2024
Human Factors Engineer

- Led HF and ergonomics evaluations across complex healthcare systems, translating findings into safety, workflow, and process improvements.
- Principal investigator 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.
- Scientific review service leading to appointment as Co-Track Chair, HFES International Symposium on Human Factors and Ergonomics in Health Care.

U.S. Army Futures Command — DEVCOM Soldier Center (Orlando, FL / West Point, NY) 2016 – 2023
Research Psychologist · Human Factors Lead

- Directed HF research programs spanning AR/VR, human-machine interaction, simulation-based training, and cyberspace warfare training (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.

Postdoctoral Research Fellow — Army Research Lab / Oak Ridge Associated Universities 2014 – 2016

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

EDUCATION

Certificate, Applied AI and Data Science — MIT Professional Education

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

M.S., Human-Computer Interaction — Georgia Institute of Technology (thesis: eye-gaze drive controls for power wheelchairs)

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

CERTIFICATIONS & AFFILIATIONS

- UX Master Certification — Nielsen Norman Group (2021)
- Engineering & Technical Manager, Practitioner (DAWIA) — Army Acquisition Workforce
- Affiliate Faculty, Yale School of Medicine, Department of Emergency Medicine (2023 – present)
- Member, HFES Healthcare Technical Group · Co-Track Chair, Simulation & Education, HFES Intl. Symposium on HF/E in Health Care (2027)

SELECTED PUBLICATIONS (HEALTHCARE, ACCESSIBILITY & USABILITY)

- Paull, S. N., Boyce, M. W., Thomas, C. A., Roncallo, H. R., Banziruk, C., Bickell, K., Zhang, L., Melendez, A., Mansour, A., Evans, L. V., & Vora, S. (2026). Implementing the Plan-Do-Study-Act model of change on virtual

reality simulation education in the emergency department. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*, 15(1), 185-189.

- Mitzner, T. L., Remillard, E. T., Mumma, K. T., & Boyce, M. W. (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.
- Vora, S., Paull, S. N., Thomas, C. A., Roncallo, H. R., Liebhardt, B., Boyce, M. W., et al. (2025). Virtual reality interprofessional simulation education to improve teamwork and the culture of safety in the emergency department. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*.
- Boyce, M. W., et al. (2024). A human factors engineering approach to improving hand hygiene quality. *Human Factors in Healthcare*, 6, 100085.
- Good, S., **Boyce, M. W.**, et al. (2024). NEAT: Nurse Effort Assessment Tool — Human Factors Considerations in Designing for Appropriate Staffing. *Proc. HFES Annual Meeting*, 68(1), 1680–1684.
- Wong, A. H., …, **Boyce, M. W.**, et al. (2024). Formative evaluation of an emergency department clinical decision support system for agitation symptoms. *BMJ Open*, 14(2).
- Gerwin, J. N., …, **Boyce, M. W.**, 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.
- **Boyce, M. W.**, Smither, J., Fisher, D., & Hancock, P. (2017). Design of instructions for evacuating disabled adults. *Applied Ergonomics*, 58, 48–58.
- **Boyce, M. W.**, Fekety, D. K., & Smither, J. A. (2012). Resource consumption and simulator driving performance using adaptive controls. *Assistive Technology* (RESNA).
- **Boyce, M. W.**, Mehta, N., Gilliland, S., & Jackson, M. M. (2011). RealWheels: Gesture-based wheelchair mobility for brain-computer interfaces. CSUN 2011 (Student Paper).

Research impact: 1,191 citations · h-index 14 · i10-index 23 (Google Scholar, August 2026) · Full publication list available on request.