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Engineering & Scientific Consulting

Chason J. Coelho, Ph.D., CSP, CFI

Senior Managing Scientist | Human Factors
15375 SE 30th Place, Suite 250 | Bellevue, WA 98007
(425) 519-8712 tel | ccoelho@exponent.com

Professional Profile

Dr. Coelho is a human factors, technical safety, and risk management professional with experience in aviation, aerospace, on- and off-shore oil, gas, and petrochemical, marine, crane, manufacturing, and utility industries. A cognitive neuroscientist whose research focuses on human motor control, he applies a uniquely interdisciplinary expertise in cognitive and physical behavior to issues such as human error prevention, decision making, human reliability, safety in design, human-machine interfacing, and ergonomics. He addresses these and other facets of human performance in routine operations, maintenance, and emergency contexts that span both process and occupational safety.

Dr. Coelho conducts proactive risk analyses aimed at reducing human error through incorporating human factors principles in design, policies, procedures, hardware, software, work environments, and team resource management. He also specializes in root cause analyses and incident investigations involving human performance gaps that lead to adverse events such as explosions, fires, chemical releases, and major equipment failures.

Dr. Coelho is a published subject matter expert on a variety of topics, including action selection, manual object manipulation, handedness, hand choice, lateralized performance asymmetries of the arms, coordination of walking, standing, and reaching behaviors, decision making, learning, visual object recognition, human fatigue risk management, and risk perception.

He holds a Certified Safety Professional designation from the Board of Certified Safety Professionals, a Certified Fire Investigator designation from the Texas Commission on Fire Protection, and a Safety Practice Certificate from Texas A&M University for advanced training in industrial hygiene, fire risk management, and other similar topics. He is also a volunteer firefighter who maintains firefighting, technical and confined space rescue, vehicle extrication, and emergency medical technician certifications.

Dr. Coelho is practiced at evaluating compliance with regulatory requirements, including those set forth by the Occupational Safety and Health Administration (OSHA), Federal Aviation Administration (FAA), Federal Motor Carrier Safety Administration (FMCSA), and other state regulators and authorities having jurisdiction (AHJs). He is also experienced at assessing conformance with industry consensus standards, including those published by the American National Standards Institute (ANSI), International Organization for Standardization (ISO), National Fire Protection Association (NFPA), and others.

Prior to joining Exponent, Dr. Coelho did his doctoral research at Pennsylvania State University after completing an internship at the University of Chicago and an undergraduate program in learning, memory, and cognition at UCLA. He started his applied professional career as a human factors design engineer supporting the International Space Station Program at NASA Johnson Space Center.

Academic Credentials & Professional Honors

Ph.D., Psychology, Pennsylvania State University, 2013

M.S., Psychology, Pennsylvania State University, 2011

B.A., Psychology, University of California, Los Angeles (UCLA), magna cum laude, 2007

National Science Foundation Graduate Research Fellowship Program: Honorable Mention (2011)

Nominated Collegiate Scholar, International Scholar Laureate Program of the Golden Key International Honor Society (2007)

UCLA Departmental Highest Honors in Psychology (2007)

UCLA University Merit Grant (2005)

California Governor's Scholar Award (2001)

Licenses and Certifications

Certified Safety Professional (CSP), Board of Certified Safety Professionals

ISO 45001, Occupational Health and Safety Management Systems (BSI)

ISO 19011, Auditing Management Systems (BSI)

Safety Practice Certificate, Mary K. O'Conner Process Safety Center, Texas A&M University

Certified Ergonomics Assessment Specialist (CEAS), BackSchool

Certified Fire Investigator (CFI), Texas Commission on Fire Protection (TCFP)

Vehicle Rescuer / Extrication Technician, Texas A&M Engineering Extension Service (TEEX)

Firefighter II (vol.), State Fire Fighters' and Fire Marshals' Association (SFFMA)

Technical and Confined Space Rescue Technician (SFFMA)

Licensed (Washington) Emergency Medical Technician (EMT) - Basic

PADI Open Water Diver #19120E4087

OPITO Approved Basic Off-shore Safety Induction and Emergency Training (BOSIET)

Helicopter Underwater Egress Training (HUET)

International Association of Drilling Contractors (IADC) RIGPASS

Escape System Training (EST)

OSHA Process Safety Management (PSM) Compliance and Auditing (ABS)

EPA Risk Management Program (RMP) Compliance and Auditing (ABS)

Root Cause Analysis (RCA) and Incident Investigation (ABS)

Process Hazard Analysis (PHA) Leader (ABS)

Federal Emergency Management Agency (FEMA) Introduction to Incident Command System (ICS) 100

FEMA ICS for Single Resources and Initial Action Incident (ICS 200)

FEMA National Incident Management System (NIMS), An Introduction (IS-00700.a)

FEMA National Response Framework, An Introduction (IS-00800.b)

Cranes and Rigging in Construction (360 Training)

Overhead Crane – Operator Safety Course (360 Training)

Pedestal Mounted Crane – Operator Safety Course (360 Training)

Lattice Boom/Crawler Crane – Operator Safety Course (360 Training)

Boom Truck/Stiff Boom Crane – Operator Safety Course (360 Training)

Arc Mapping Basics (CFI Trainer)

Electrical Safety (CFI Trainer)

Physical Evidence at the Fire Scene (CFI Trainer)

Academic Appointments

Lecturer (Psychology, Research Methods, Statistics), Psychology Department, Pennsylvania State University, 2011-2013

Professional Affiliations

Board of Certified Safety Professionals (BCSP)

Human Factors & Ergonomics Society (HFES)

National Association of Emergency Medical Technicians (NAEMT)

National Fire Protection Association (NFPA)

State Fire Fighters' and Fire Marshals' Association (SFFMA)

Publications

Coelho, C.J., Lakhiani, S.D., & Morrison, D. (2020). Stay Alert: Incorporate Fatigue into Risk Management. *Chemical Engineering Progress*, 116(1), 40-45.

Staying Alert: Incorporating Human Fatigue in Risk Management. Proceedings of the International Annual Meeting of the Human Factors and Ergonomics Society, October 28-November 1, 2019.

Pushing Past Prescription: Fatigue Risk Management Systems in the Utilities Industry. *Operations*

Conference and Biennial Exhibition, Nashville, Tennessee, April 30-May 3, 2019.

Brown, A. & Coelho, C.J. (2017). Modeling Goal-Directed Movements in Modern Pistol Competition. IEEE International Conference on Systems, Man, and Cybernetics. Banff, Canada.

Solnik, S., Pazin, N., Coelho, C.J., Rosenbaum, D.A., Scholz, J.P., Zatsiorsky, V.M., & Latash, M.L. (2014). Postural sway and perceived comfort in pointing tasks. *Neuroscience Letters*, 569, 18-22.

Hollaway, D. M. A., Johnson, J. D., & Coelho, C.J. (2014). There will be blood: API 770 and Human Error Prevention in Process Safety. 17th Annual International Symposium, MKO Process Safety Center, Texas A&M University, College Station, TX, 773-786.

Coelho, C.J., Studenka, B.E., & Rosenbaum, D.A. (2013). End-state comfort trumps handedness in object manipulation. *Journal of Experimental Psychology: Human Perception and Performance*, 40, 718-730.

Rosenbaum, D.A., Chapman, K.C., Coelho, C.J., Gong, L., & Studenka, B.E. (2013). Choosing actions. *Frontiers in Psychology*, 4, Article 273.

Coelho, C.J. & Rosenbaum, D.A. (2013). Is handedness just response bias? *Psychonomic Bulletin & Review*, 20, 957-962.

Solnik, S., Pazin, N., Coelho, C.J., Rosenbaum, D.A., Scholz, J.P., Zatsiorsky, V.M., & Latash, M.L. (2013). End-state comfort and joint configuration variance during reaching. *Experimental Brain Research*, 225, 431-442.

Coelho, C.J., Przyblyla, A., Yadav V., & Sainburg, R.L. (2013). Hemispheric differences in the control of limb dynamics: A link between arm performance and arm selection patterns. *Journal of Neurophysiology*, 109, 825-838.

Przyblyla, A., Coelho, C.J., Akpınar, S., Kirazci, S., & Sainburg, R.L. (2012). Sensorimotor performance asymmetries predict hand selection. *Neuroscience*, 228C, 349-360.

Coelho, C.J., Nusbaum, H., Rosenbaum, D.A., & Fenn, K.M. (2012). Imagined actions aren't just weak actions: Task variability promotes skill learning in physical practice but not in mental practice. *Journal of Experimental Psychology: Language, Memory, and Cognition*, 38, 1759-1764.

Rosenbaum, D.A., Coelho, C.J., Rhode, J.D., & Santamaria, J.P. (2010). Psychologically distinct classes of motor behavior inferred from individual differences: Evidence from a sequential stacking task. *Journal of Motor Behavior*, 42, 187-194.

Knowlton, B.J., McAuliffe, S.P., Coelho, C.J., & Hummel, J.E. (2009). Visual priming of inverted and rotated objects. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35, 837-848.

Representative Presentations

Coelho CJ, Cullen P, Lakhiani SD, Morrison DR. Human Factors in Process Safety Management, Short Course. 15th Global Congress on Process Safety, New Orleans, Louisiana, March 31, 2019.

Coelho CJ, Cullen P, Lakhiani SD, Morrison DR. Staying Alert: Incorporating Fatigue in Risk Management. 15th Global Congress on Process Safety, New Orleans, Louisiana, April 1, 2019.

Coelho, C.J. (2016). Addressing Human Factors in Process Safety - Corporate and Plant Practices, 12th Global Congress on Process Safety, Houston, TX, American Institute of Chemical Engineers (AIChE).

Coelho, C.J. (2018). A Novel Approach to Reducing Human Error in Utility Industries, Electric Power, Nashville, TN.

Coelho, C.J. & Fiume, L. (2018). A Novel Approach to Reducing Human Error in Utility Industries, The Changing Face of Station Maintenance, Centre for Energy Advancement through Technological Innovation (CEATI) International.

Peer Reviewer

Acta Psychologica

Cognition

Ergonomics in Design

Experimental Brain Research

Frontiers in Cognitive Psychology

Human Factors

Journal of Motor Behavior

Laterality