

KATHERINE ANDREA LEMOS, PH.D.

A Safety Professional and Social Psychologist with a documented record of exceptional contribution to the advancement of safety performance in transportation and medical domains

EDUCATION AND DESIGNATIONS

- Ph.D. Social Psychology, 2002, University of Iowa, Iowa City, IA
- M.S. Counseling Psychology (Behavior/Health), 1992, California Lutheran University, Thousand Oaks, CA
- B.B.A. Business Management, 1988, Belmont University, Nashville, TN
- APMG-International: Certified Change Management Practitioner, 2013, London, UK

AVIATION CREDENTIALS

- Commercial Pilot & Certified Flight Instructor (Instrument): Airplane, Single & Multi-Engine Land & Sea
- Captain and Flight Instructor/Check Pilot – Civil Air Patrol Congressional Squadron (2006 – Present)
- Flight Test Pilot Short Course at National Test Pilot School (Certificate 2009)
- Skydiving Program (AFF), 2008
- Member: Aircraft Owners and Pilots Association (AOPA), Intl. Society for Air Safety Investigators (ISASI)

LANGUAGES

- English (native)
- Spanish (advanced: written/spoken)
- Portuguese (moderate: written/spoken)

EMPLOYMENT AND ACADEMIC EXPERIENCE

Federal Aviation Administration (FAA), Washington, D.C. (2008 – Present)

Aviation Safety (AVS) Line of Business

Aviation Safety Statistician – Office of Accident Investigation & Prevention (AVP) (2010 – Present): Focus on system safety in promoting safety risk management and safety assurance principles, including leadership roles in industry-wide safety analysis activities and research and development

- Program Manager – Office of Aircraft Certification Services (AIR) – FAA AVS Research, Engineering and Development Management Team: *Develop recommendations for process improvement and change management; Provides leadership and oversight of AIR research nation-wide*
- Representative for the Office of Accident Investigation and Prevention (AVP) – FAA AVS Research, Engineering and Development Team: *Promotes and provides leadership and oversight of system safety research; Focus on data sharing and advanced analytical techniques to identify and mitigate system-level risk*
- Data and Accident Analysis – Commercial Aviation Safety Team (CAST) Aircraft State Awareness Subcommittee: *Lead analyst for narrative safety data; Provides expertise in human factors, operations/training and design*
- Subject Matter Expert – Human Factors in Accident Investigation: *Provides expertise for the FAA's team of accident investigators, including individual and team performance to organization and system safety*
- Government Co-Chair – NextGen Joint Product Development Office (JPDO) Safety Working Group – Safety Management Implementation Standing Committee: *Led and coordinated industry-government group of aviation-related business and agencies in implementing Safety Management Systems*

Flight Deck Human Factors - Office of Aircraft Certification Services (AIR) (2008 – 2010): Human factors subject matter expert for the development and interpretation of regulations and guidance materials pertaining to advanced technologies for the flight deck

- Represented AIR's needs pertaining to Advanced Vision Systems, Data Link Systems, and Flight Deck Weather Technologies
- Leadership role in FAA/Industry committees (RTCA) in developing minimum performance requirements and standards, with a focus on developing, evaluating, coordinating, and monitoring FAA research for product development, verification and validation
- Supported nationwide aircraft certification offices and directorates through interpretation of human factors regulation and guidance materials in the certification process, and training FAA designee flight test pilots and engineers in conducting human factors evaluations
- Subject Matter Expert on system safety risk assessment methodologies for human performance

Instituto Tecnológico de Aeronáutica (ITA), São José dos Campos, SP, Brazil (2009 – Present)

Aviation Safety Systems Specialization

Healthcare Systems Specialization (in conjunction with UNIFESP; Universidade Federal de São Paulo)

Visiting Professor: Development and delivery of graduate courses; Co-Advisor for Ph.D. candidates in Aeronautical Engineering and Aviation Safety

- Human Factors in Aviation Safety: *Overview from systems and life-cycle perspectives*
- Aviation Safety Management Systems: *ICAO requirements for the aviation industry and lessons learned from High Reliability Organizations across diverse industries*
- Human Factors in Aviation Systems Engineering: *Systems engineering perspective in addressing human factors in design of procedures and equipment*
- The Human Element in Safety Performance: *Social influence and sustainable behavior change in aviation and medical domains*

National Transportation Safety Board (NTSB), Washington, D.C. (2005 – 2008)

Senior Human Performance Investigator – Aviation Safety Division: Investigated the contributing role of human factors in aviation accidents to provide safety recommendations to the aviation industry.

- Managed accident investigation focus teams as Group Chairman in the domain of Human Factors and Flight Operations
- Coordinated with internal and external safety analysis teams to create a relevant context regarding the prevalence of causal factors in the development of recommendations.
- Presented and defended findings and recommendations to board members for product approval with other members of the investigative team (*Abbreviated list of investigations in publications section below*)

Special Assistant to the Vice Chairman of the Board: Served 8-month detail as advisor to NTSB Vice Chairman Robert Sumwalt, supporting his role in the accident investigation process across all transportation modes (rail, pipeline and hazardous materials, highway, marine and aviation):

- Assisted the Vice Chairman in preparation for press briefings, outreach presentations, and board meetings through speech writing, arranging educational briefings, notation review, research and summary of special topics
- Special topics included runway safety, organizational culture, Safety Management Systems, systems approach to investigations and pilot professionalism
- Liaison with other board member offices and staff

National Aeronautics and Space Administration (NASA), Hampton, VA (2003 – 2011)

Langley Research Center: Aviation Safety and Security Program (AvSP); Aviation Airspace Systems Program

Consultant to National Institute of Aerospace (2007 – 2011): Provides expertise to NASA in experiment design and analysis, survey design, database creation, writing and editing, and human factors. Previous projects include:

- NASA's NextGen Airportal Project – MetroPlex Operations: Research and analysis of issues and constraints associated with operations from the gate to overhead flow integration. Output included White Papers, technical research investment analysis frameworks and roadmaps
- NASA's support to the NextGen JPDO Safety Working Group: Significant contributor to development of the National Aviation Safety Strategic Plan, and the industry-wide Safety Issues Database

Principal and Co-Investigator (2003-2005): Managed interdisciplinary research teams in developing, conducting, analyzing and presenting human factors research focused on advanced weather display concepts for general aviation applications, with flight tests conducted at NASA Kennedy Space Center and at Langley AFB:

- Invited to participate as a *NASA Faculty Fellow* - University of Iowa, Department of Industrial and Mechanical Engineering. Continued work as a *Visiting Assistant Professor* - University of Maryland, Department of Aerospace Engineering (through NIA)
- Secured a Cooperative Research Agreement with Bendix/King–Honeywell, Intl. for comparative closure rate depictions, as well as the assistance of several academic institution flight schools
- Reviewed program research proposals across AvSP for integrity of experiment design and analytical technique

University of Iowa, Iowa City, IA (1996 – 2004)

Department of Industrial and Mechanical Engineering

Department of Psychology

Co-Investigator, Project Development and Project Management – Operator Performance Laboratory (2002-2004):

Managed interdisciplinary research teams in developing, conducting, analyzing and presenting human factors research focused on Advanced Vision Systems for commercial and general aviation applications:

- Sought and obtained grants from NASA LaRC and Rockwell Collins, Inc. (*Recipient of a NASA Group Achievement Award, 2003 and 2004*)
- *In partnership with a major airline, provided expertise in experiment design and metric development*: Evaluated and developed a new measurement for the effectiveness of Crew Resource Management (CRM) training and developed a method to measure the relationship between workload and performance for Constant Descent Approach Procedures

Researcher, Lab Coordinator/Research Assistant, Teaching Assistant, and Ph.D. Student (1996-2002): Trained and managed research teams in developing, conducting, analyzing and presenting research for behavioral and social psychological topics, including risk perceptions and attitudes, social control and interaction, goal conflict and communication in dyads.

- *Ph.D. Dissertation*: Statistics in context: The influence of comparative statistical information on risk attitudes and behavior. Outcome based on a series of three experiments across population samples.
- *Teaching Assistant*: Introduction to Social Psychology and Experiment Design II for Cognitive Psychology.

PUBLICATIONS AND CONTRIBUTIONS

- Lemos, K. (*in press*, 2013), *Accident Case Example – Runway Excursions*. Professional Pilot Magazine, Queensmith Communications Corporation: Alexandria VA.
- Commercial Aviation Safety Team (2012), *Mid-Term Report of Sub-Committee for Aircraft State Awareness (final/public report expected May 2013)*.
- Sumwalt, R., Lemos, K (2010). Accident Investigator's Perspective. *Crew Resource Management, Second Edition*. Helmreich, R.L., Kanki, B.G, Anca, J. (Eds), Academic Press (Elsevier): London.
- Darr, S., Morello, S., Shay, R., Lemos, K. & Jacobson, R. (2009), A consideration of constraints on airport departure operations. *National Aeronautics and Space Administration, Langley Research Center*, June 2009. Report No: NASA/CR-2009-215763. NASA LaRC: Hampton, VA.
- Federal Aviation Administration (2010), *Advisory Circular 20-140A: Guidelines for Design Approval of Aircraft Data Link Communication Systems Supporting Air Traffic Services (ATS)*. FAA Aircraft Engineering Division, AIR-130: Washington, D.C
- Federal Aviation Administration (2010), *Advisory Circular 20-167, Airworthiness Approval of Enhanced Vision System, Synthetic Vision System, Combined Vision System, and Enhanced Flight Vision System Equipment*. FAA Aircraft Engineering Division, AIR-130: Washington, D.C.
- Darr, S. Ricks, D. & Lemos, K. (2008). Safer Systems: A NextGen Aviation Safety Strategic Goal. *Proceedings of the 27th Digital Avionics Systems Conference*, Minneapolis, MN.
- National Transportation Safety Board (2009), *Houston Helicopters, Sikorsky S-76A, N90421, Gulf of Mexico, TX, August 6, 2005*, Investigation Number DFW05MA230. NTSB: Washington, D.C.
- National Transportation Safety Board (2008), *Northwest Airlines, Inc., Boeing 747-200, N627US, Agana, Guam*, Investigation Number SEA05LA176. NTSB: Washington, D.C.
- National Transportation Safety Board (2008), *Runway Overrun During Landing Shuttle America, Inc., Doing Business as Delta Connection Flight 6448, Embraer ERJ-170, N862RW, Cleveland, OH, February 18, 2007*, Report Number AAR-08-01. NTSB: Washington, D.C.
- National Transportation Safety Board (2008), *Runway Overrun and Collision Southwest Airlines Flight 1248, Boeing 737-74H, N471WN, Chicago, IL, December 08, 2005*, Report Number AAR-07-06. NTSB: Washington, D.C.
- National Transportation Safety Board (2007), *Northwest Airlines, Inc., MD DC-9-51, N763NC, and Airbus A-319, N358NB, May 10, 2005*, Investigation Number CHI05MA111A/B. NTSB: Washington, D.C.
- National Transportation Safety Board (2006), *Controlled Flight into Terrain, Era Aviation, Sikorsky, S-76A++, N579EH, March 23, 2004*, Report Number AAR-06-02, Washington, D.C.
- Martin, R., Johnsen, E. L., Bunde, J., Bellman, S. B., Rothrock, N. E., Weinrib, A., & Lemos, K. (2005). Gender differences in patients' attributions for myocardial infarction: Implications for adaptive health behaviors. *International Journal of Behavioral Medicine*, 12(1), 39-45.
- Lemos, K. & Chamberlain, J. (2004). In-flight weather trending information: Optimal looping characteristics for animated NEXRAD images. *Proceedings of the 23rd Digital Avionics Systems Conference*, Salt Lake City, NV.
- Chamberlain, J. & Lemos, K. (2004). Design considerations for presenting data-linked animated radar imagery on in-flight displays. *Proceedings of the 23rd Digital Avionics Systems Conference*, Salt Lake City, NV.
- Martin, R., Lemos, K., Rothrock, N., Bellman, B., Russell, D., Tripp-Reimer, T., Lounsbury, P. & Gordon, E. (2004). Gender disparities in common sense models of illness among myocardial infarction victims. *Health Psychology*, 23(4), 345-353.

- Keller, M., Lemos, K., Schnell, T., Parrish, R. & Glaab, L. (2003). Pilot performance as a function of display resolution and field of view in simulated flight using synthetic vision systems. *Proceedings of the 22nd Digital Avionics Systems Conference*, Indianapolis, IN.
- Lemos, K., Schnell, T., Etherington, T., Vogl, T. & Postikov, A. (2003). Synthetic Vision Systems: Human performance assessment of the influence of terrain density and texture. *Proceedings of the 22nd Digital Avionics Systems Conference*, Indianapolis, IN.
- Yang, S., Schnell, T. & Lemos, K. (2003). Spatial image content bandwidth requirements for synthetic vision displays. *Proceedings of the 22nd Digital Avionics Systems Conference*, Indianapolis, IN.
- Schnell, T., Lemos, K., Keller, M., Yang, S. & Gutierrez, F. (2003). *Synthetic Vision Systems: Optimal Display Characteristics*. Technical report for NASA LaRC dated October 27, 2003, Operator Performance Laboratory, University of Iowa, Iowa City, IA.
- Jenson, M., Suls, J. & Lemos, K. (2003). A comparison of physical activity in men and women following hospitalization for CHD. *Women and Health*, 37(1), 31-48.
- Lemos, K., Suls, J., Jenson, M., Lounsbury, P. & Gordon, E.E.I. (2003). How do female and male cardiac patients and their spouses share responsibilities after discharge from the hospital? *Annals of Behavioral Medicine*, 25(1), 8-15.
- Schnell, T. & Lemos, K. (2003). *Synthetic Vision Systems: Terrain Density, Texture and Shading characteristics*. Technical report (Deliverable 4.4.1.1) dated January 2003, Rockwell Collins, Cedar Rapids, IA.
- Lemos, K., Schnell, T., Gordon, D. & Etherington, T. (2002). Bye-bye steam gages, welcome glass: A review of new display technology for general aviation aircraft. *Proceedings of the 21st Digital Avionics Systems Conference*, Irvine, CA.
- Schnell, T. & Lemos, K. (2002). *Synthetic Vision Systems: Terrain Density, Texture and Shading Characteristics*. Technical report (Deliverable 4.2.2.1) dated September 2002, Rockwell Collins, Cedar Rapids, IA.
- Lemos, K. (2002). Statistics in context: The Influence of Comparison Information on Naïve Risk Perceptions. *Dissertation Abstracts International: Section B: The Sciences & Engineering. Vol 63(4-B)*, Oct 2002, 2108, US: University Microfilms International.
- Suls, J., Lemos, K. & Stewart, L. (2002). Self-esteem, construal and comparisons of self versus friends and others. *Journal of Personality and Social Psychology*, 82(2), 252-261.
- Martin, R. & Lemos, K. (2002). From heart attacks to melanoma: Do common sense models of somatization influence symptom interpretation for female victims? *Health Psychology*, 21(1), 25-32.
- Martin, R., Lemos, K., & Leventhal, H. (2001). The psychology of physical symptoms and illness behavior. In G. J. G. Asmundson, S. Taylor, & B. J. Cox (Eds.), *Health anxiety: Clinical and research perspectives on hypochondriasis and related conditions*, (pp. 22-45). Chichester, UK: Wiley.

INVITED TALKS AND CONFERENCE PRESENTATIONS

- Lemos, K. System Safety Management, *Federal Aviation Administration: Research, Engineering and Development Advisory Committee Bi-Annual Reviews*, 2010 – 2013; Washington, DC; Atlantic City, NJ.
- Lemos, K. Human Factors: Beyond the Slogan, *Second Symposium of Safety of Flight, Institute of Aeronautics – Flight Test and Instruction*, August, 2011; São José dos Campos, Brazil.
- Lemos, K. Human Factors in Rotorcraft Accident Investigation, *Federal Aviation Administration: Advanced Rotorcraft Accident Investigation Course*, February 2011; Oklahoma City, OK.
- Lemos, K. Human Factors in Aircraft Certification – System Engineering Perspectives, *Commercial Aviation Safety Team, Aircraft State Awareness Joint Safety Analysis Team*, October 2010; Denver, CO.

- Lemos, K. Aviation Safety in the Context of Safety Culture, *International Seminar on Safety in Complex Technological Systems, Pontifical University of Rio Grande do Sul Faculty of Aeronautical Sciences*, November 2010; Porto Alegre, Brazil.
- Lemos, K. Human Factors in Aircraft Certification, *Federal Aviation Administration: Recurrent Training for Designated Engineering Representatives*, August 2010; New York, NY.
- Lemos, K. Human Factors in Aircraft Certification, *Federal Aviation Administration Recurrent Training for Designated Engineering Representatives*; March – August 2009. Wichita, KS; Dallas, TX; Atlanta, GA; Boston, MA, Chicago, Ill.
- Darr, S. Ricks, D. & Lemos, K. Safer Systems: A NextGen Aviation Safety Strategic Goal, *Proceedings of the 27th Digital Avionics Systems Conference*, October 2008; Minneapolis, MN.
- Lemos, K. & Chamberlain, J. In-flight weather trending information: Optimal looping characteristics for animated NEXRAD images, *23rd Digital Avionics Systems Conference*, October 2004; Salt Lake City, NV.
- Chamberlain, J. & Lemos, K. Design considerations for presenting data-linked animated radar imagery on in-flight displays, *23rd Digital Avionics Systems Conference*, October 2004; Salt Lake City, NV.
- Lemos, K. Statistics in Context: The Influence of Comparison Information on Naïve Risk Perceptions – Applications in the Aviation Domain, NASA Ames, October 2003; San Jose, CA.
- Keller, M., Lemos, K., Schnell, T., Parrish, R. & Glaab, L. Pilot performance as a function of display resolution and field of view in simulated flight using synthetic vision systems, *22nd Digital Avionics Systems Conference*, October 2003; Indianapolis, IN.
- Lemos, K., Schnell, T., Etherington, T., Vogl, T. & Postikov, A. Synthetic Vision Systems: Human performance assessment of the influence of terrain density and texture, *22nd Digital Avionics Systems Conference*, October 2003; Indianapolis, IN.
- Yang, S., Schnell, T. & Lemos, K. Spatial image content bandwidth requirements for synthetic vision displays, Monica Hughs (Chair), Synthetic Vision Systems Track, *22nd Digital Avionics Systems Conference*, October 2003; Indianapolis, IN.
- Schnell, T., Lemos, K., Keller, M., Yang, S. & Gutierrez, F. Synthetic Vision Systems: Optimal Display Characteristics, *NASA Langley Research Center: Project Review*, July 2003; Hampton, VA.
- Lemos, K., Schnell, T., Gordon, D. & Etherington, T. Bye-bye steam gages, welcome glass: A review of new display technology for general aviation aircraft, Chamberlain, J. (Chair), General Aviation Technologies Track, *21st Digital Avionics Systems Conference*, October 2002; Irvine, CA.
- Lemos, K., Effect sizes: Methods of calculating and reporting effect sizes in the social sciences. *University of Iowa Department of Psychology*, March 2001; Iowa City, IA.
- Martin, R. & Lemos, K. Effects of stereotypes on symptom perception and illness behavior. Alex Rothman (Chair), Understanding the impact of stereotypes, discrimination, and prejudice on mental and physical health. *Midwestern Psychological Association*, May 2000; Chicago, IL.
- Martin, R., & Lemos, K. Somatization stereotypes: Does information about sex and stress influence symptom interpretation? *University of Iowa Department of Psychology*, April 2000; Iowa City, IA.
- Lemos, K., Jenson, M.E., Suls, J., Lounsbury, P. & Gordon, E.E.I. Adapting to cardiac disease: Male patients receive greater assistance from spouses than do female patients, *Society of Behavioral Medicine*, April 2000; TN.
- Lemos, K., Jenson, M.E., Suls, J., Lounsbury, P. & Gordon, E.E.I. Significance of attending cardiac rehabilitation: Symptom reporting in high risk patients, *American Association of Cardiovascular Rehabilitation*, September 1999; Phoenix, AZ.