



The Multitasking Myth

Handling Complexity in Real-World Operations
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Despite growing concern with the effects of concurrent task demands on human performance, and research demonstrating that these demands are associated with vulnerability to error, so far there has been only limited research into the nature and range of concurrent task demands in real-world settings. This book presents a set of NASA studies that characterize the nature of concurrent task demands confronting airline flight crews in routine operations, as opposed to emergency situations. The authors analyze these demands in light of what is known about cognitive processes, particularly those of attention and memory, with the focus upon inadvertent omissions of intended actions by skilled pilots.

The studies reported within the book employed several distinct but complementary methods: ethnographic observations, analysis of incident reports submitted by pilots, and cognitive task analysis. They showed that concurrent task management comprises a set of issues distinct from (though related to) mental workload, an area that has been studied extensively by human factors researchers for more than 30 years.

This book will be of direct relevance to aviation psychologists and to those involved in aviation training and operations. It will also interest individuals in any domain that involves concurrent task demands, for example the work of emergency room medical teams. Furthermore, the countermeasures presented in the final chapter to reduce vulnerability to errors associated with concurrent task demands can readily be adapted to work in diverse domains.

Contents

Preface; Introduction; What is multitasking and how is it accomplished?; The ideal: flight operations as depicted by flight operations manuals; The real: flight operations add complexity and variability; Analysis of concurrent task demands and crew responses; The research applied; Appendices; Glossary; References; Index.

About the Author

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Dr Loukopoulos has a PhD in Cognitive Psychology from the University of Massachusetts and an Aerospace Experimental Psychology designation from the United States Navy. She spent 6 years on active duty as an aviation psychology officer in the Navy before becoming a Senior Research Associate at NASA Ames' Human Systems Integration Division. She currently resides in Athens, Greece where she is a human factors consultant to the Hellenic Air Accident Investigation and Aviation Safety Board and was a member of the team that investigated the major aircraft accident that took place outside Athens in 2005. She is involved in a number of aviation human factors research and teaching activities, through NASA Ames Research Center/San Jose State University Foundation, the Hellenic Institute of Transport, and the Hellenic Air Force Safety School.

Dr. Dismukes is Chief Scientist for Aerospace Human Factors in the Human Systems Integration Division at NASA Ames Research Center. His research addresses cognitive issues involved in the skilled performance of pilots and other experts, their ability to manage challenging situations, and their vulnerability to error. Current research topics include prospective memory (remembering to perform deferred intentions), management of attention in concurrent task performance, pilots' use of checklists and monitoring, and training crews to analyze their own performance. Previously, Dr. Dismukes was Director of Life Sciences at the Air Force Office of Scientific Research. He received his PhD in biophysics from Pennsylvania State University and conducted postdoctoral research at the Johns Hopkins University School of Medicine and the National Institutes of Health. He has published several books and numerous scientific papers in basic and applied psychology and neuroscience, and has written on the implications of science and social policy for the public. He holds airline transport pilot, B737 and Citation type, and glider instructor ratings.

Dr Barshi is a Senior Principle Investigator in the Human-Systems Integration Division at NASA Ames Research Center. His current research addresses cognitive issues involved in the skilled performance of astronauts, pilots, and flight/air traffic controllers, their ability to manage challenging situations, and their vulnerability to error. Among the topics investigated by his research group are spatial reasoning, decision making, risk assessment, communication, and skill acquisition and retention. The results of his work have been implemented in operational procedures and training programs in space, aviation, medicine, and nuclear facilities. Dr Barshi holds PhDs in Linguistics and in Cognitive Psychology. He has published papers in basic and applied psychology, linguistics, and aviation. He holds Airline Transport Pilot certificate with B737 and CE500 Type Ratings; he is also a certified flight instructor for airplanes and helicopters, with over 30 years of flight experience.

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