

## **Absent Aviators**

### Gender Issues in Aviation

### Edited by

### **DONNA BRIDGES**

Charles Sturt University, Australia

#### JANE NEAL-SMITH

London Metropolitan Business School, UK

and

### ALBERT J. MILLS

St Mary's University, Canada

**ASHGATE** 

#### © Donna Bridges, Jane Neal-Smith and Albert J. Mills 2014

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.

Donna Bridges, Jane Neal-Smith and Albert J. Mills have asserted their right under the Copyright, Designs and Patents Act, 1988, to be identified as the editors of this work.

Published by Ashgate Publishing Limited Wey Court East Union Road

Farnham Surrey, GU9 7PT

England

Ashgate Publishing Company 110 Cherry Street Suite 3-1 Burlington, VT 05401-3818

USA

www.ashgate.com

#### **British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

#### The Library of Congress has cataloged the printed edition as follows:

Absent aviators: gender issues in aviation / [edited] by Donna Bridges, Jane Neal-Smith and Albert Mills. pages cm Includes bibliographical references and index.

ISBN 978-1-4724-3338-1 (hbk) -- ISBN 978-1-4724-3339-8 (ebk) -- ISBN 978-1-4724-3340-4 (epub) 1. Air pilots--Sex differences. 2. Women air pilots. 3. Airplanes--Piloting--Human factors. 4. Sex role in the work environment. I. Bridges, Donna, editor. II. Neal-Smith, Jane, editor. III. Mills, Albert J., 1945- editor.

HD8039.A4A27 2014 331.4'82913--dc23

2014010730

ISBN: 978 1 4724 3338 1 (hbk)

ISBN: 978 1 4724 3339 8 (ebk – PDF) ISBN: 978 1 4724 3340 4 (ebk – ePUB)



Printed in the United Kingdom by Henry Ling Limited, at the Dorset Press, Dorchester, DT1 1HD

### ABSENT AVIATORS

### Donna Bridges

To my grandmother Johanna Bolger (1919–2012), who had a wonderful enthusiasm for life through which she challenged many ideas about gender and became an inspiring role model to us all.

#### Albert J. Mills

To my granddaughters Harvie Lois and Amber Lulu, may they reach for the stars and know no earthly bounds, and to Maryanne Hardman – financial advisor, friend and female pilot – whose life was cut short when her ultra-light plane crashed in early May, 2014.

#### Jane Neal-Smith

To my colleagues and friends – Wendy, Chris, Etienne, Chris and Vanessa – a very special thank you.

### About the Editors

**Donna Bridges** holds a PhD in Sociology from the University of Western Sydney (UWS). Her doctoral thesis, 'The gendered battlefield: Women in the Australian Defence Force', is a qualitative, feminist exploration of gender inequalities in the Australian Defence Force (ADF). She lectures across a range of sociology subjects at Charles Sturt University. She is also co-editor of the qualitative research book *Creative Spaces for Qualitative Researching: Living Research* (with Higgs, J., Titchen, A., Horsfall, D. and Bridges, D. (2011)). Her research interests include qualitative research methodologies; gender, masculinity and feminist theory; culture; peace studies; peacekeeping and women's roles; and military sociology.

Albert J. Mills is Professor of Management and Director of the PhD (Management) Program at Saint Mary's University, Halifax, Nova Scotia, Canada. His 300 publications include numerous books, book chapters and journal articles on gender and commercial aviation. He is Associate Editor of three scholarly journals – Organization, Gender, Work and Organization and Qualitative Research in Organizations and Management – and serves on the editorial boards of several other journals. He is the author of Sex, Strategy and the Stratosphere: The Gendering of Airline Cultures and his latest book is ANTi-History: Theorizing the Past, History, and Historiography in Management and Organizational Studies (2012).

Jane Neal-Smith has a PhD in Industrial Psychology and Sociology, which explored the working lives of UK commercial women airline pilots. She is currently a senior lecturer at London Metropolitan Business School in the Management, Strategy and Leadership subject group. Her research interests are in aviation psychology and human factors, women in the workplace, gender in employment and organisational behaviour. She is a member of the Royal Aeronautical Society (MRAeS) and the European Association for Aviation Psychology (EAAP).

### About the Contributors

**Ronald W. Bishop**, who is currently undertaking his PhD, is Head of the Aviation programme at Central Queensland University and is Former Operations Superintendent of the Air Force Special Operations and Rescue School with over 5,000 flying hours as an Aircrew member in USAF Special Operations. He began his career in US Air Force rescue and has over 300 saves. He was awarded three presidential presented awards, including the Hoyt and Tunner Award for Aviation Excellence during operations in Afghanistan and Iraq. His research interests are human factors in aviation, mental workload of aircrew, and air quality in aircraft. He is married and has two children. He currently lives in Central Queensland.

**Reinhard Braunstingl**, who holds a PhD in mechanical engineering, is Associate Professor and leader of the 'Research Platform Flight Simulation' at Graz University of Technology, Austria. He is an experienced commercial pilot and flight instructor, and is Austrian Aerobatics Champion in the Sportsmen category. His research activities focus on human—machine interaction (HMI) design, flight simulation and flight training.

**Bridget Cox** received her undergraduate degree in Aviation Business with a concentration in Airport Management and a minor in Psychology from Embry-Riddle Aeronautical University. She also went on to pursue her Master's degree in Business Administration from Embry-Riddle Aeronautical University and graduated in the spring of 2011. She began her career in May 2009 as an intern for Business Development at Signature Flight Support and was offered a full-time position as an Operations Analyst in January of 2011. In her current role she is responsible for tracking key metrics for Signature's North American locations, is in charge of the customer loyalty programme and has been involved with the acquisition and transition of new locations into Signature's network.

**Klaus Fruehwirth** is an aeronautical engineer, flight instructor and commercial pilot with type rating for C525 Series. He is the founder of Brightline Avionics, Austria and is counsellor at Becker Avionics, Germany. He is an expert in the development and usability evaluation of glass cockpits and radio communication systems for aviation.

**Group Captain Deanne Gibbon** is both an academic and member of the Royal Australian Air Force (RAAF). She has significant experience working in strategic human resource policy development, training management, personnel capability

and recruiting. She is completing her final year of a sociology doctorate at the University of New South Wales, where she is examining flying as a field of non-traditional employment for civil and military pilots. She is also currently applying the outcomes of her academic research to an Air Force project designed to significantly increase the number of women in Air Force pilot positions. As the Director of Workplace Diversity, she is implementing a further range of initiatives that are designed to encourage previously untapped demographics towards joining the Air Force. She is particularly passionate about identifying barriers preventing higher numbers of women from joining the ADF and finding creative ways to mitigate those barriers, such that higher numbers of women might enjoy an ADF career.

**Erich Grubmueller** is an aeronautical engineer at Brightline Avionics, Austria and a PhD student at Graz University of Technology. His research in the field of electronics and computer sciences focuses on embedded systems, airborne devices and human—machine interface. He applies human factors in the specification and development of hardware for airborne devices.

Penny Rafferty Hamilton, who holds a PhD, has academic degrees from Temple University, Philadelphia, Pennsylvania; Columbia College, Columbia, Missouri; and the University of Nebraska, Lincoln, Nebraska. In 2013, she was given Columbia College's Distinguished Alumni Award. In addition to university teaching and business experience, she has written numerous general aviation articles in publications such as National Association of Flight Instructors: MENTOR and Seaplane Magazine, and in E-zines such as the State Aviation Journal and AV ED Journal. In 2012, she earned the National Association of State Aviation Officials National Journalism Award. She is the author of two history books, Granby: Then and Now and Around Granby. She co-holds with her husband, Bill, a World Aviation Speed Record, set on 22 October 1991, awarded by the Federation Aeronautique Internationale and the National Aeronautic Association. In 2011, she was inducted into the Colorado Aviation Hall of Fame. She is an active member of many general aviation organisations. In 2013, she was honoured in the Amelia Earhart International Forest of Friendship in Atchison, Kansas. In 1994, the FAA named a new holding intersection in Colorado at an altitude of 15,500 feet above sea level after her as part of the U.S. aeronautical system. She is the recipient of the FAA Central Region 'Champion of Aviation Education Award'. In 2009, she was named ABC Television-Denver 7 'Everyday Hero' for over 25 years of volunteer community aviation education programmes. She is also the volunteer Director of the Teaching Women to Fly Research Project, which focuses on promoting success for women in general aviation, especially flight training.

**Joshua Hirschheimer** has been an aviation enthusiast since childhood. He has received two Bachelor's degrees: a Bachelor of Arts in Urban Planning from CUNY Hunter College and a Bachelor of Science in Airport Management and Air

Traffic Control at the Vaughn College of Aeronautics. He continued his education with a Master's degree in Airline Management at Embry-Riddle Aeronautical University, where he served as a research assistant in the areas of labour relations and organisational behaviour. He is a consultant at Sabre Airline Solutions, working with airlines worldwide and specialising in airline network planning and airspace operations. He currently lives in Dallas, Texas.

Giby Abraham Jacob hails from India. He obtained his undergraduate degree in Mechanical Engineering from Mahatma Gandhi University in India. Because of his passion for aviation, he moved to Florida to pursue his Master's degree in Business Administration at Embry Riddle Aeronautical University. He is currently working on his Master's degree with a specialisation in airline and airport operations, and is working as a graduate research assistant.

**Ioana Koglbauer**, who holds a PhD in psychology, is a pilot, aviation psychologist and human factors expert at Brightline Avionics Austria. Her current research activities focus on gender issues in aviation, human-centred design and evaluation of glass cockpit systems, navigation and collision avoidance devices, and cockpit automation. She has authored scientific papers in the areas of pilot performance and anticipative behaviour, threat and error management training, aviation psychophysiology, simulator and real-flight evaluations.

Alexandra Kristovics received her PhD in psychology. She is currently a lecturer in Organisational Behaviour in the Organisational Studies Programme for the School of Business at the University of Western Sydney (UWS). Prior to her present position, she also taught in the UWS School of Psychology for 10 years. She was also a consultant for an organisational psychology firm and was a practising psychologist. These roles helped her to develop a better understanding of the individual, social and structural factors underpinning both functional and dysfunctional behaviours/attitudes in the workplace.

**Siegfried Loesch**, who holds a PhD in mechanical engineering, is a hot air balloon pilot and justified expert for aviation technology in Austria. His current research activities include the development of algorithms and software for EFIS and flight simulator applications at Graz University of Technology, Austria. He is also General Manager of LCE Lösch Cellular Engineering Ziviltechniker GmbH, which develops regular cellular metallic materials.

**Jean Helms Mills** is Professor of Management at the Sobey School of Business, Saint Mary's University, Canada. She is the author of *Making Sense of Organizational Change* (2003) and co-author of *Understanding Organizational Change* (2009). She has presented her work on historiography, critical sensemaking, gender, culture and change at numerous conferences and has published in a variety of journals. She is Associate Editor for *Gender, Work and Organization*,

serves on the editorial boards of a number of journals and is past divisional Co-Chair of the Critical Management Studies Division of the Academy of Management. She also worked for a major airline for 17 years.

**Alexandru Milut** is a Revenue Management Analyst with Silver Airways in Ft. Lauderdale, Florida. He is a rated single- and multi-engine Commercial Pilot, as well as a Certificated Flight Instructor. In addition to his practical background in aviation, he earned a Master's in Business Administration and a Bachelor of Science in Aeronautical Science from Embry-Riddle Aeronautical University in Daytona Beach, Florida. During his days as a student, he worked as a graduate research assistant and banner-tow pilot.

Jim Mitchell is Lecturer in Management at the UWS. He gained his PhD in 2000 in industrial sociology and has taught in the management, human resource and aviation programmes. Prior to joining UWS, his work experience included some 30 years in a variety of industries. These include food manufacturing, health insurance and the airline industry in a range of management and administrative roles, mainly human resource management. His main research interests are in gender issues in organisations and aviation in particular from a cross-cultural perspective. He has published in this area in conjunction with international colleagues.

Preven Naidoo began his flying career in the South African Air Force (SAAF) in 1996, where he obtained his wings, and flew the Pilatus Astra and Cessna Caravan. In 2000, he continued his flying career as a commercial pilot, initially for Swazi Express Airways, then South African Express Airways (SAX) and presently with South African Airways (SAA). At SAA he flew the Boeing 747-400, the Airbus A319/320 and currently the Airbus A330/340. He has been with SAA for 10 years and is a Senior First Officer with around 10,000 hours of flight time; presently, he is flight operations CRM training manager and flight instructor on the Airbus A330/A340 fleet. He received a Bachelor of Commerce degree (BCom) in Aviation Management, an Honours degree (BCom Hons) in Business Management, a Master of Philosophy degree (MPhil) in Human Resource Management and a PhD in Organisational Behaviour from the University of Pretoria (South Africa). His research interests are in research methodology, quantitative/mathematical industrial psychology and aviation human factors. He is a research supervisor to MBA students at the University of Pretoria's Gordon Institute of Business Science (GIBS).

Rosemarie Reynolds has obtained her Bachelor's and Master's degrees in management, and her doctorate in industrial psychology. After graduation, she worked as a research psychologist at Naval Air Warfare Systems, Training Division, in Orlando, Florida. She left Naval Air Warfare Systems to join Embry Riddle Aeronautical University. She has been at the Embry Riddle College of Business since 2002, where she teaches classes in organisational behaviour,

research methodology and statistics. She has published in a variety of journals, including the *Journal of Aviation/Aerospace Education and Research*, the *Journal of Airport Management* and the *Journal of Air Transportation*.

Air Commodore (Dr) Tracy Smart AM, BMBS, Dip Avmed, MPH, MA, FRACMA, FACASM, FASMA, FCDSS, AFACHSM, joined the RAAF as a medical undergraduate in 1985. She has served as a Medical Officer and Senior Medical Officer at bases around Australia, has undertaken overseas postings with the RAF and the USAF, was the first female Chief Instructor and then Commanding Officer of AVMED and was Officer Commanding Health Services Wing. She has had operational experience in Rwanda, Timor Leste, the Middle East and Lebanon, and was awarded a CAF Commendation for her role in a fatal air accident investigation in Malaysia. She attended the Centre for Defence and Strategic Studies as a student in 2008 and was promoted to AIRCDRE and posted into the dual roles of Director General Corporate Health Management and Air Force Health Services within Joint Health Command in February 2009. From 2010 to 2012 inclusive, she performed the role of Director General Garrison Health Operations, in which she managed healthcare at over 70 locations on Defence bases throughout Australia and oversaw a major reform in health service delivery in the ADF. She assumed the role of Strategic Health Coordination in January 2013, with responsibility for policy and research coordination, military medical advice, the Australian Army Malaria Institute and special projects. She has authored 14 published articles and over 70 papers for presentation at scientific meetings, primarily in the areas of aviation medicine, aeromedical evacuation and military medicine. She was made a Member of the Order of Australia in the 2012 Queen's Birthday Honours List.

Emeritus Professor Dr Leopold P. Vermeulen enjoyed tenure in an academic position at the University of Pretoria for 40 years. He was Head of the Academic Department of Human Resource Management from 1986 to 2007 and was involved in various research projects in the military field between 1973 and 1982. From 1982, he shifted his research focus contribution to human resource management, organisational behaviour and aviation psychology. He has authored and co-authored 38 refereed articles, 17 research reports and 12 non-refereed publications. He has delivered and co-delivered 44 conference papers (18 national and 26 international). Twelve PhD and 36 Master's students completed their dissertation successfully under his supervision. Although he retired in 2010, he is still actively involved in research and the supervision of PhD students.

**Shannon R. Webb** is a PhD candidate in Management (Saint Mary's University) and an LLM candidate (Osgoode Hall). Her educational background includes a BA (Queen's University), an LLB (Western University) and an MIR (Queen's University). She is employed as a labour and employment lawyer. She is also a member of the part-time faculty at Saint Mary's University and has taught with the

Centre for Industrial Relations at Queen's University. She is also a member of the Nova Scotia Labour Relations Board.

Heidi A. Weigand is a PhD candidate in the Management Department, Sobey School of Business, at Saint Mary's University, Canada. She also serves as a management consultant with the Saint Mary's University Business Development Centre. She has been a part-time instructor in both the marketing and management departments at Saint Mary's University as well as the Public Relations department at Mount Saint Vincent University. Her research is in the areas of sport and organisational performance management, goal-setting, employee engagement and motivation, intersectional discrimination studies and human resource social media technology. She is currently investigating the effects of a social media performance model on employee engagement, organisational commitment and psychological capital. She is on the board of directors for the Canadian Centre of Ethics in Public Affairs and serves as part of the research committee. She comes from a private sector background with over 20 years of management experience in the US and Canada with Xerox and IBM.

### Acknowledgements

Our very grateful thanks go to the chapter authors for their commitment to this book and to the field of study. We particularly thank them for their patience in seeing the book through to fruition.

We are most indebted to our colleague and fellow author Dr Jim Mitchell from the University of Western Sydney in Australia. Jim envisioned the book and originally it was he who initiated the project to compile it. Through Jim's research and his connections, nationally and internationally, he was able to garner the participation of the diverse and committed group of authors who have contributed to this collection. His dedication to the field of aviation studies and particularly to gender and aviation shaped his vision for the book. We thank Jim for his ambition and for enabling us to play a part in this endeavour.

Many thanks are due also to Guy Loft and his colleagues from Ashgate for their support and guidance in completing this project.

## Contents

List oj	f Figures and Tables	vii
About	the Editors	ix
About	the Contributors	xi
Ackno	wledgements	xvii
Introd	uction	1
PART	I IDENTIFYING GENDER ISSUES IN PILOTING	
1	The Junctures of Intersectionality: Race, Gender, Class and Nationality and the Making of Pan American Airways, 1929–89 <i>Heidi Weigand, Shannon R. Webb, Albert J. Mills and Jean Helms Mills</i>	15
2	Difficult, Dangerous, Not a Job for Girls: Factors Impacting Women and Girls' Orientation Towards Pilot Careers  Deanne Gibbon	43
3	Fast Women: Or Why Women Who Fly High-Performance Aircraft are Fast But Not Loose Tracy Smart	73
	Postscript to Chapter 3 Fast Women in the Twenty-First Century Tracy Smart	91
4	Gender-Based Attitudes Regarding Pilot Behaviour Rosemarie Reynolds, Alexandru Milut, Giby Abraham Jacob, Joshua Hirschheimer and Bridget Cox	97
PART	II BARRIERS IN MILITARY AND CIVIL AVIATION	
5	Unexpected Turbulence: The Cultural, Gender-Based Challenges Facing Female Pilots in the Australian Defence Force Deanne Gibbon	115

6	Grounded? Female Pilots, Gender Identity and Integration into the Australian Defence Force <i>Donna Bridges</i>	147			
7	Another Empty Kitchen: Gender Issues on the Flight Deck Jim Mitchell, Alexandra Kristovics and Leopold P. Vermeulen	165			
8	Flying through Barriers: Identifying Issues for Female Airline Pilots Jane Neal-Smith	187			
PART	THI TECHNICAL ISSUES				
9	Automation in Light Aircraft: A Cross-national Analysis Alexandra Kristovics, Jim Mitchell, Ronald W. Bishop, Preven Naidoo and Leopold P. Vermeulen	211			
10	Gender Issues in Usability of Glass Cockpit for General Aviation Aircraft Ioana Koglbauer, Reinhard Braunstingl, Klaus Fruehwirth, Eric Grubmueller and Siegfried Loesch	239			
11	Glass Cockpits in General Aviation: A Comparison of Male and Female Pilots' Perceptions  Jim Mitchell, Alexandra Kristovics and Ronald W. Bishop	261			
PART IV TAKING ACTION					
12	Leaving Gender 'In': The Royal Australian Air Force's Project to Increase the Representation of Female Pilots  Deanne Gibbon	287			
13	The Teaching Women to Fly Research Project Penny Rafferty Hamilton	313			
Concl	usion	333			
Index		341			

# List of Figures and Tables

F	i	a	1	ĸ	r	Δ	c
ж.		2	u	ı.		C	Э

10.1	Mean self-ratings for the occurrence of unexpected events of female and male pilots in different modes and types of operation	
	(ratings from -5 low to +5 high)	249
10.2	Mean self-ratings of forgetting of female and male pilots in different	
	modes and types of operation (ratings from -5 low to +5 high)	250
10.3	Mean self-ratings of positive emotion of female and male pilots	
	in different modes and types of operation (ratings from 1 very	
	slightly or not at all to 5 extremely)	252
10.4	Mean ratings of difficulties in finding display elements of female	
	and male pilots in different modes and types of operation (ratings	
	from -5 low to +5 high)	253
Table	S	
3.1	Qualified ADF female aircrew (as at April 2013)	92
4.1	Sample characteristics	101
4.2	Characteristics of male sample	102
4.3	Attitudes regarding female pilots by gender	104
4.4	Male pilot attitudes regarding female pilots by age	105
4.5	Male pilot attitudes regarding female pilots by number of flight hours	105
4.6	Male pilot attitudes regarding female pilots by years of flying	106
4.7	Male pilot attitudes regarding female pilots by opportunities to fly	
	with the opposite gender	106
4.8	Male pilot attitudes regarding female pilots by level of certification	107
4.9	Male pilot attitudes regarding female pilots by flight instructor rating	107
4.10	Male pilot attitudes regarding female pilots as a function of CRM	
	training	108
7.1	Timeline of Australian female pilot firsts	168
7.2	Minimum licence costs (Australian dollars)	171
7.3	Themes and nodes	173
7.4	Comments per theme	174
9.1	The original ACAS items	214
9.2	Participant details	216
9.3	Revised scale	218

9.4	Correlations between the latent factors from revised measure	219
9.5	Coefficients for the standardised factor structure of the revised scale	220
9.6	Differences between Australian and South African pilots	222
9.7	Difference between means of less and more experienced glass	
	cockpit pilots	223
9.8	Differences between male and female pilots	224
9.9	Differences between Australian and South African male and female	
	pilots	226
10.1	Descriptive variables of the pilot groups	243
10.2	Subjective ratings of performance, workload and emotion	
	and objective measures of task duration, standardised	
	psychophysiological activation of female and male pilots in	
	different modes and types of operation	247
10.3	Ratings of situation awareness of female and male pilots when using	
	the device in different modes and types of operation	248
10.4	Mean and standard deviations of usability scores in female and male	
	pilots	254
11.1	Participant details	267
11.2	Differences between male and female responses	269