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Effectiveness of Hazardous Attitudes Mitigation in Pilot Training

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Matthew D. Furedy

National Training Aircraft Symposium

August 14, 2018

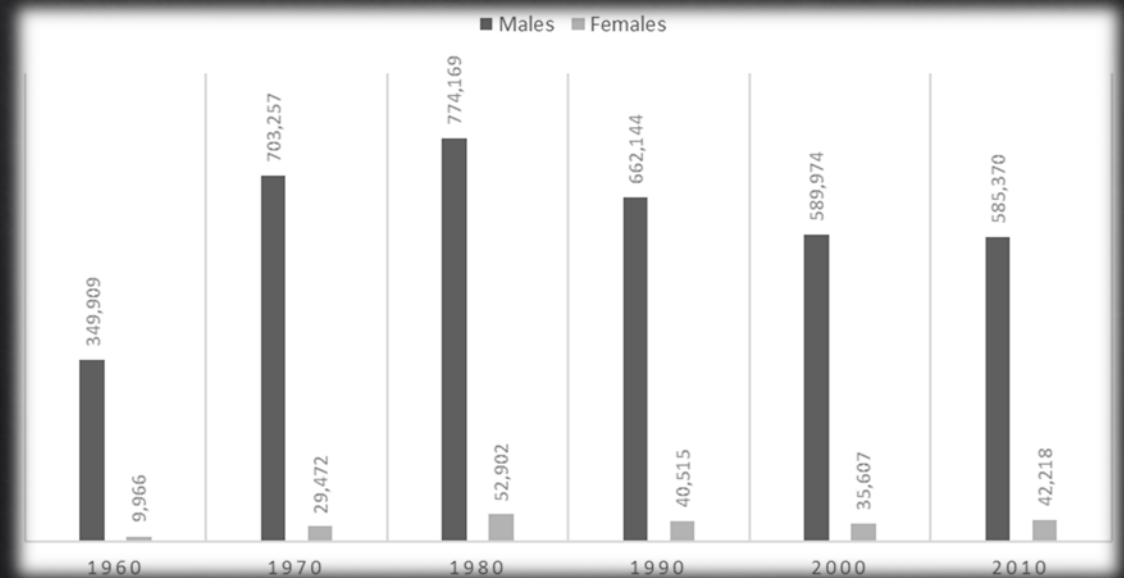
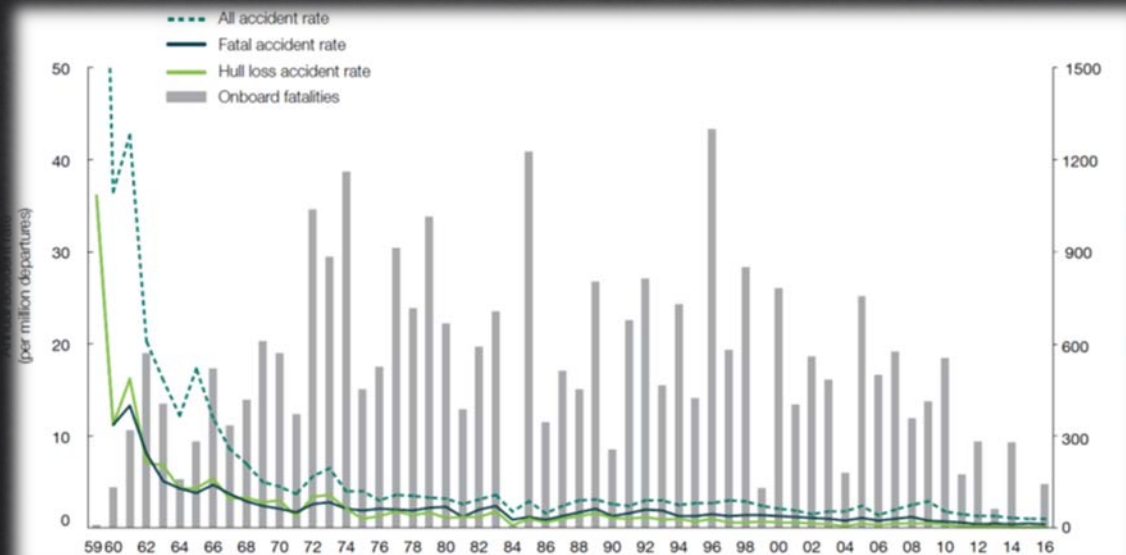
The Premise

- ◆ Sky Kings: Learning to fly like a girl (King, 2015)
 - ◆ Females = Safer?
- ◆ British Civil Air Authority (CAA; 1995)
 - ◆ Males = 4 times more likely
- ◆ Accident severity/fatalities (Bazargan & Guzhva, 2011)
 - ◆ Not rate of accidents, accidents that lead to fatalities

FLY LIKE A  **GIRL**

A New Look

- ◇ Accidents from pilot error = over 75% in 2012 (AOPA, 2015)
- ◇ Females in aviation = 4.3% in 2012 (AOPA, 2015)
- ◇ Aeronautical Decision Making / Hazardous Attitudes
 - ◇ Up to 50% reduction in accidents by participants



Differences?

◇ Gender Differences

◇ **Aggression**

- ◇ Males = Direct (physical & vocal)
- ◇ Females = Indirect (emotional & social) ... less risky
- ◇ (Anderson & Bushman, 2002)

◇ **Communication**

- ◇ Males = directive, dominant, hierarchical, task-focused
- ◇ Females = supportive, cooperative, and egalitarian
- ◇ (Helgeson, 2017; Tannen, 1990)

◇ **Spatial Visualization**

- ◇ Males = Mental rotation “most consistent difference”
- ◇ Females = Remembering locations of objects
- ◇ (Jones & Healy, 2006)

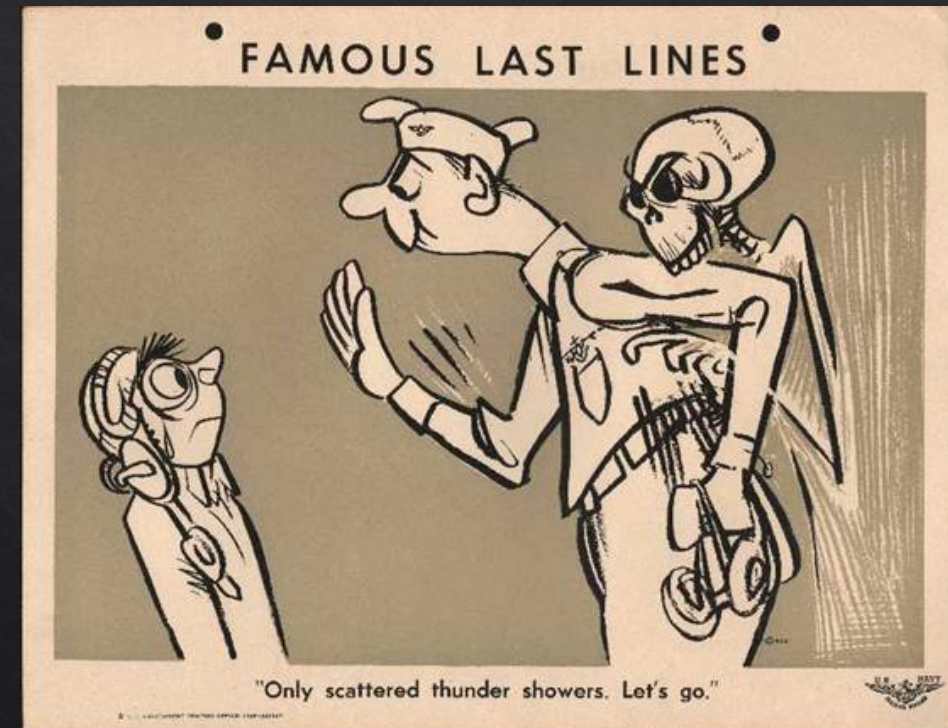


Differences

- ◆ Impact of Gender on General Aviation Accidents
 - ◆ Female insurance premiums
 - ◆ Gender, age, race, geographic location
 - ◆ Bosari (2013)
 - ◆ Females adhere to rules and regulations
 - ◆ Use seatbelts
 - ◆ Avoid driving while intoxicated
 - ◆ McClosky and Earle (2005)
 - ◆ Females involved in fewer fatal accidents
 - ◆ Vail and Ekman (1986) – Males = 2 times more likely
 - ◆ Bener et al. (2013) – Males = 3 times more likely
 - ◆ Britain's Civil Aviation Authority (1995) – Males = 4 times more likely

Hazardous Attitudes

- ◇ Hazardous Attitudes
 - ◇ “Personal motivation tendency that affects an individual’s ability to make good decisions” (Lee & Park, 2016)
 - ◇ Hazardous attitudes - corrected through training
 - ◇ Anti-authority
 - ◇ Impulsivity
 - ◇ Invulnerability (Anxiety/Worry)
 - ◇ Macho
 - ◇ Resignation
 - ◇ Self Confidence



Pilot Training



- ◆ Pilot Training

- ◆ HA's mitigated through proper training
- ◆ ADM
 - ◆ Mnemonic checklists improve decision-making / takes longer
 - ◆ Practice in simulator
- ◆ Certified Flight Instructors
 - ◆ Educational philosophies & ideologies may aggravate HA's
 - ◆ Wetmore, Lu and Caldwell (2007)

Participants

Gender		
Female	26	14.1%
Male	159	85.9%

Class Level		
Freshman	77	41.6%
Sophomore	40	21.6%
Junior	30	16.2%
Senior	35	18.9%
Graduate	3	1.6%

Flight training		
Basic	139	75.1%
Advanced	46	24.9%

Training Level		
Student Pilot	87	47.0%
Private Pilot	52	28.1%
Instrument Pilot	42	22.7%
Commercial Pilot	2	1.1%
Certified Flight Instructor	2	1.1%

n = 185

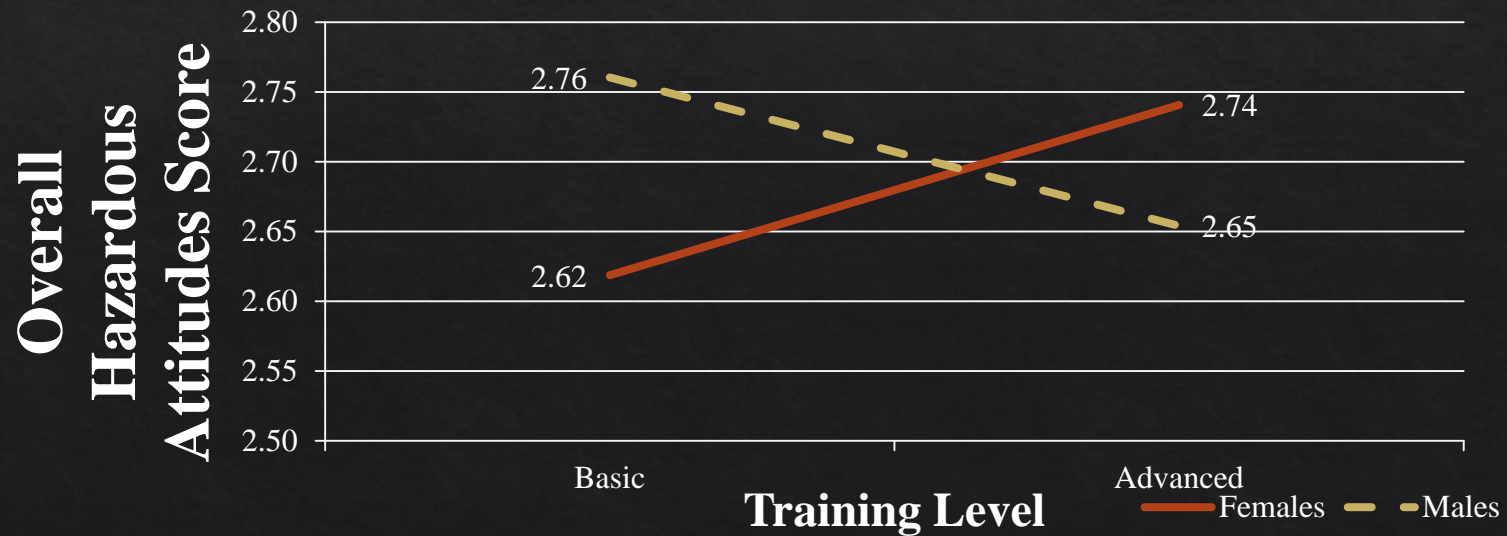
Gender vs Hazardous Attitudes

	Females (n = 26)		Males (n = 159)		t	df	p
	Mean	SD	Mean	SD			
Macho	<u>2.46</u>	<u>0.56</u>	<u>2.75</u>	<u>0.55</u>	<u>-2.47</u>	<u>183</u>	<u>0.015</u>
Resignation	2.19	0.48	2.28	0.53	-0.79	183	0.433
Anti-Authority	2.02	0.45	2.14	0.44	-1.27	183	0.205
Anxiety/Worry	3.13	0.56	2.95	0.48	1.64	183	0.104
Impulsivity	2.39	0.46	2.51	0.43	-1.25	183	0.212
Self Confidence	3.74	0.44	3.78	0.47	-0.37	183	0.712
Overall Attitude	2.66	0.21	2.73	0.23	-1.62	183	0.107

Flight Training Levels vs Hazardous Attitudes

	Flight Training				t	df	p
	Basic (n = 139)		Advanced (n = 46)				
	Mean	SD	Mean	SD			
Macho	2.69	0.57	2.75	0.50	-0.65	183	0.516
Resignation	<u>2.33</u>	<u>0.50</u>	<u>2.08</u>	<u>0.53</u>	<u>2.90</u>	<u>183</u>	<u>0.004</u>
Anti-Authority	2.14	0.45	2.08	0.44	0.80	183	0.426
Anxiety/Worry	2.97	0.48	2.99	0.55	-0.18	183	0.855
Impulsivity	2.50	0.41	2.47	0.50	0.37	183	0.712
Self Confidence	<u>3.82</u>	<u>0.45</u>	<u>3.64</u>	<u>0.47</u>	<u>2.28</u>	<u>183</u>	<u>0.024</u>
Overall Attitude	2.74	0.24	2.67	0.21	1.88	183	0.062

	Females/ Basic (n = 18)		Females/ Advanced (n = 8)		Males/ Basic (n = 121)		Males/ Advanced (n = 38)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Macho	2.32	0.50	2.77	0.58	2.74	0.56	2.75	0.50
Resignation	2.24	0.48	2.09	0.50	2.34	0.51	2.08	0.54
Anti-Authority	1.94	0.50	2.20	0.25	2.17	0.43	2.06	0.46
Anxiety/Worry	3.11	0.46	3.17	0.78	2.95	0.49	2.95	0.49
Impulsivity	2.28	0.41	2.64	0.49	2.53	0.41	2.44	0.51
Self Confidence	3.82	0.43	3.57	0.44	3.82	0.46	3.65	0.48
Overall Attitude	2.62	0.19	2.74	0.24	2.76	0.24	2.65	0.20



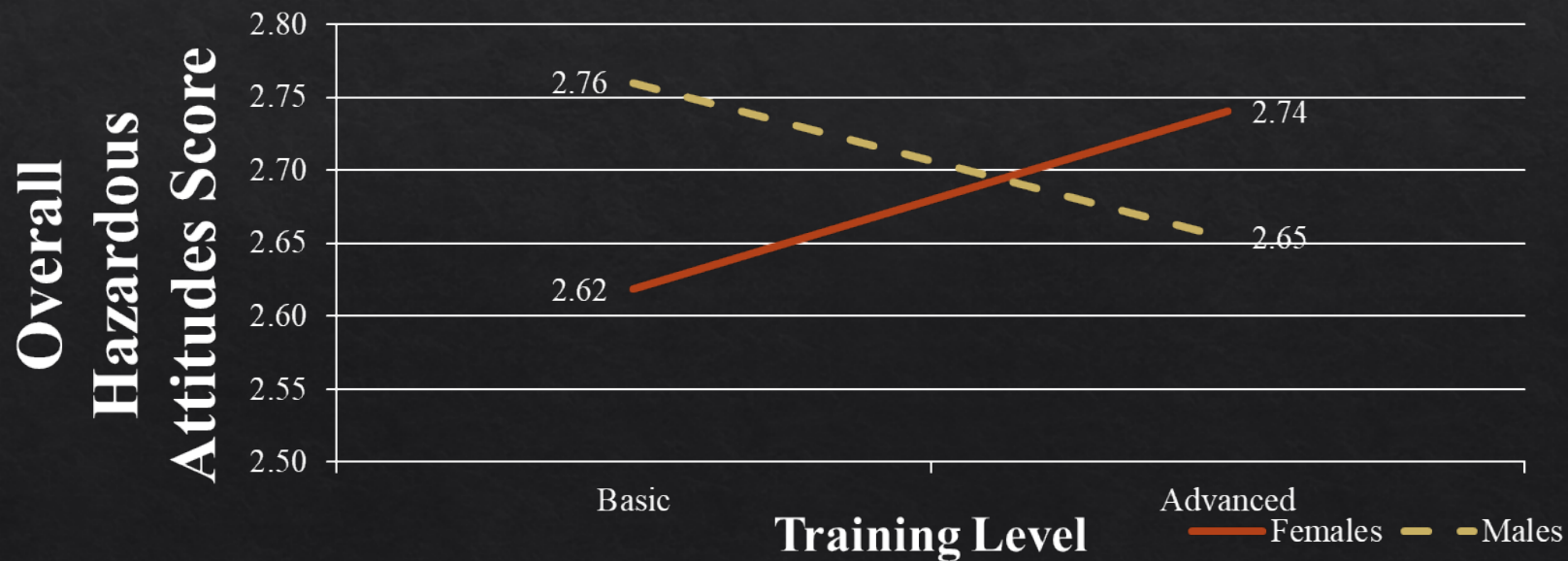
Outcomes Unanticipated

- ◆ Previous research...why the difference
 - ◆ Generalizable / transferable
 - ◆ Previous research
 - ◆ Current research
 - ◆ Populations characteristics
 - ◆ Collegiate flight school students
 - ◆ Age = Early 20's
 - ◆ Midwest region of US
 - ◆ Societal factors
 - ◆ Like a Girl ads (Proctor & Gamble)



Outcomes Unanticipated

- ◇ Hazardous Attitudes vs training levels:
 - ◇ Higher HA scores in females with more training?
 - ◇ Training Design?
 - ◇ Flaw in the study?



Future Research



Best Practices of Learning

- Female vs. Male learning

Flight Training Study

- Practical Test Standards vs. Airman Certification Standards

Repeat this Study

- Flight schools compared across US

Thank you