Stress, Wellbeing, Culture, & COVID-19 Among Aviation Professionals: A Cross-Cultural Study to Support Wellbeing Initiatives

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Introduction

- In April 2020, responding to the COVID-19 pandemic, The Flight Safety Foundation published *An Aviation Professional's Guide to Wellbeing,* listing stress that reduces and activities that improve wellbeing (2020).
- This study used Geert Hofstede's dimensions of national culture to apply a cross-cultural analysis to the *Guide*.
- This analysis, along with considerations for demographics, occupation, and family life, test and support implementation of the *Guide* across cultures.

Hofstede Cultural Dimensions

These values, calculated from surveys using Hofstede's work, uses these cultural dimensions to quantify national culture across six dimensions. Each dimension is a mean value for the respondents in that nation (2010).
- Power Distance (PDI)
- Individualism vs. Collectivism (IDV)
- Masculinity vs. Femininity (MAS)
- Uncertainty Avoidance (UAI)
- Long-Term Orientation (LTO)
- Indulgence vs. Restraint (IVR)

Figure 1
Cultural Dimensions for select nations

Legend: Arab Countries, Brazil, China, Netherlands, U.S.A.
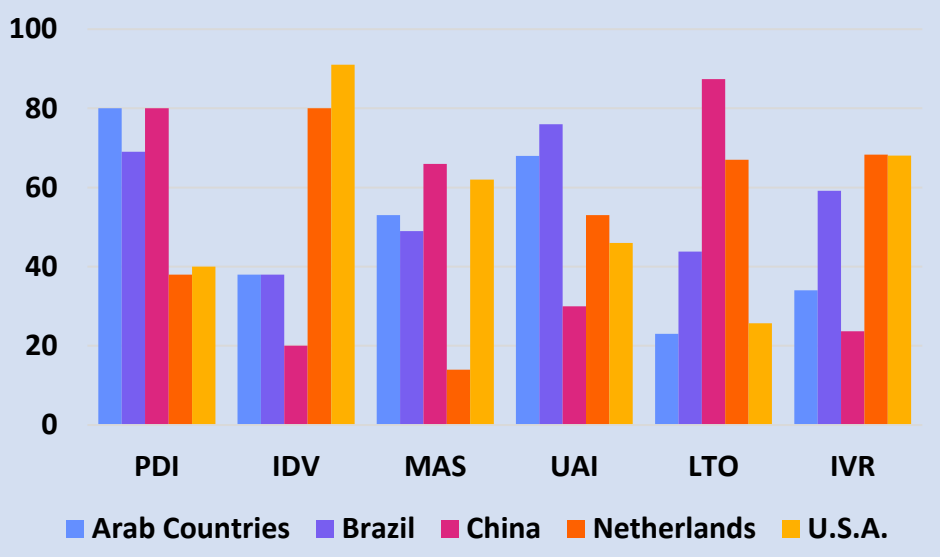
Research Questions

- How do the stressors & activities in the *Guide* correlate to wellbeing?
- How do demographics, experience, education, organizations, and pandemic impacts inform the correlations?
- How do cultural dimensions inform the correlations?

Survey Methodology

- The survey, in summer 2020, asked respondents:
  - To rate their stress, wellbeing, coping with the pandemic, and coping with stress
  - The presence of 20 stressors and 11 activities listed in the *Guide*
  - Ratings of employer, union, and regulator concern for and management of the pandemic
  - Family responsibilities and impacts of pandemic at work and home
  - Education, experience, and demographics
- 206 aviation professionals from 28 countries participated in survey.

Major Research Findings Before Cultural Dimension Analysis

- Ratings of stress, wellbeing, coping with stress, and coping with the COVID-19 pandemic combined into an internally reliable Wellbeing Index (WBI) ($\alpha = 0.894$).
- 15 of 17 stressors listed in the *Guide* significantly negatively correlated with the Wellbeing Index, as shown in Figure 1
- Using 4 of 11 activities suggested by the *Guide* significantly correlated with the Wellbeing Index, as shown in Table 2
- The Wellbeing Index significantly correlated with five of six organizational ratings, as show in Figure 3

Figure 2
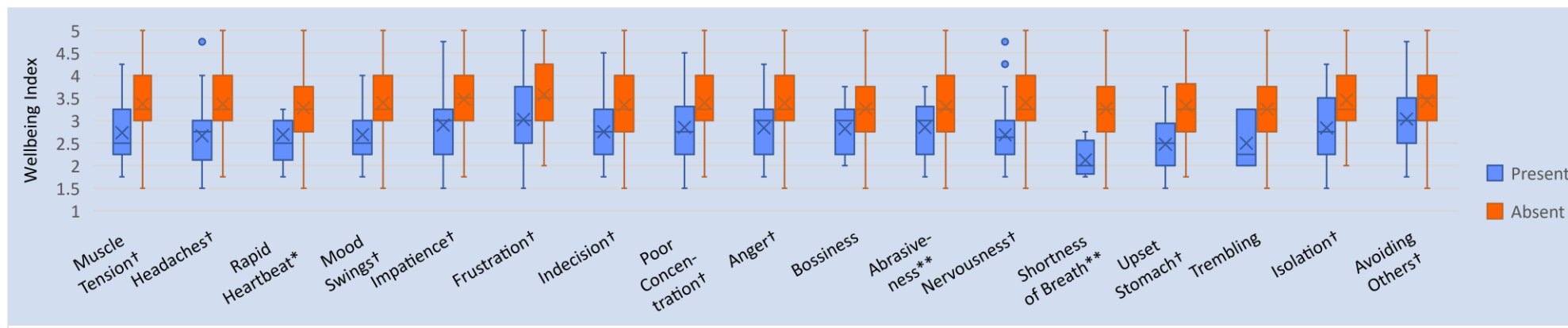The Wellbeing Index in respondents reporting presence or absence of stressor. *$p<.05$, **$p<.01$, †$p<.001$

Figure 2
Correlations of Wellbeing Index and agreement with activities, *$p<.05$, **$p<.01$, †$p<.001$

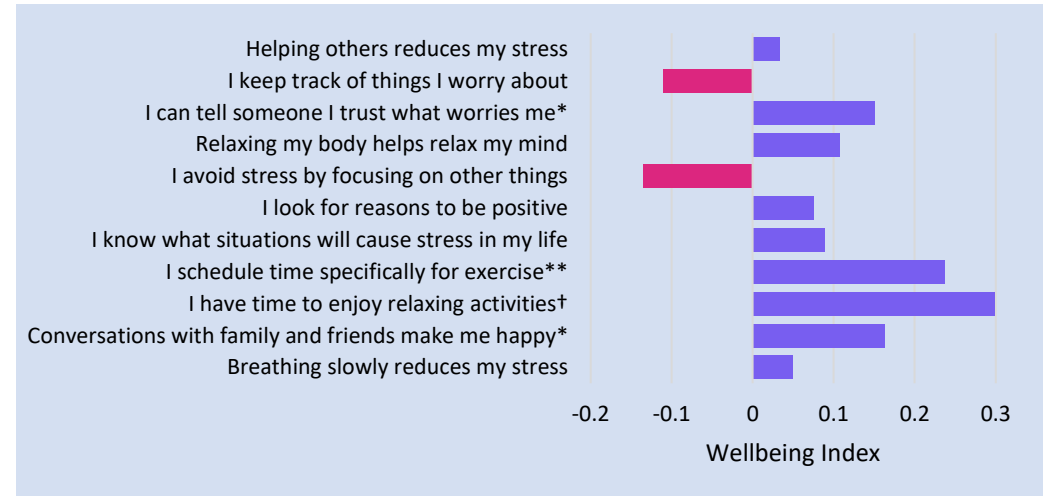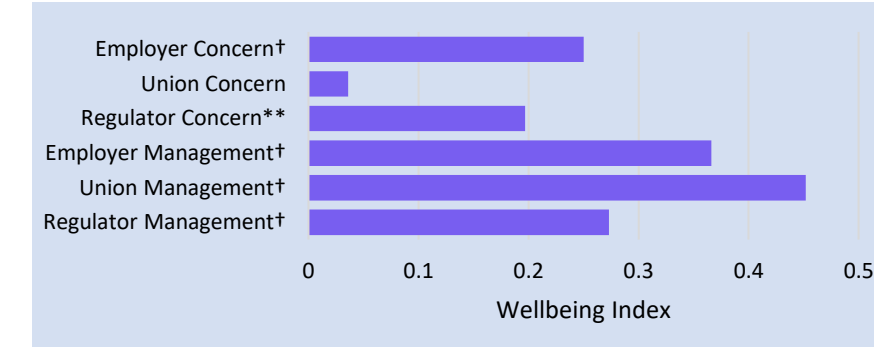**Figure 3**
Correlations of Wellbeing Index and org. ratings, *$p<.05$, **$p<.01$, †$p<.001$

Major Research Findings After Cultural Dimension Analysis

- An increased Wellbeing Index significantly correlated with less power distance, more individualism, and a greater acceptance of uncertainty in respondents' home countries, as shown in Figure 4.
- 8 of 17 stress factors from the *Guide* significantly correlate with cultural dimensions, as shown in Table 1.
- 6 of 11 activities recommended by the *Guide significantly* correlate with cultural dimensions, as shown in Table 2
- Ratings of union management of the pandemic significantly correlated with less power distance, more individualism, less uncertainty avoidance, and a more long-term orientation

Figure 4
Correlations of Wellbeing Index and cultural dimensions
*$p<.05$, **$p<.01$, †$p<.001$

Table 1
Significant differences in mean cultural dimensions between those reporting a stressor and those not reporting that stressor. Insignificant results are not shown.

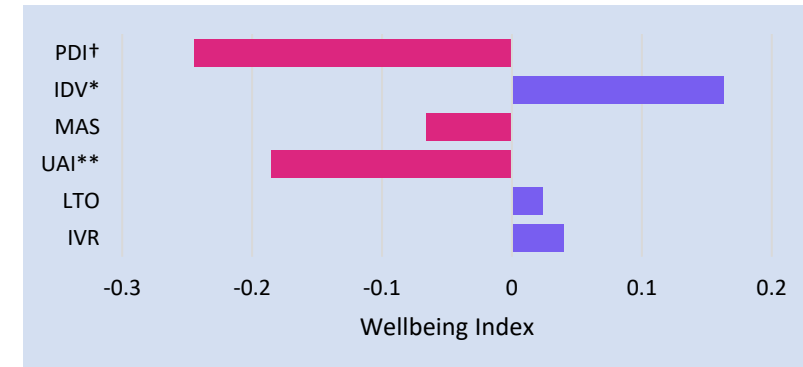| Stressor Present	PDI	IDV	MAS	UAI	LTO
Rapid Heartbeat			3.42*		
Impatience					-4.22*
Indecision			4.06**		-6.70**
Anger		8.73*	3.54*		
Abrasiveness	-3.67**	13.73**	4.13**	-4.42†	-3.68*
Nervousness					-4.64*
Shortness of Breath			47.32†		
Isolation		8.61**			

*$p < .05$, **$p < .01$, †$p < .001$

Table 2
Significant differences in mean cultural dimensions between those reporting a stressor and those not reporting that stressor. Insignificant results are not shown.

Stressor Present	PDI	IDV	UAI
Conversations with friends and family make me happy		-.163*	
I know what situations will cause stress in my life		-.150*	
I look for reasons to be positive		-.164*	
I avoid stress by focusing on other things	.147*	-.174*	
Relaxing my body helps relax my mind		-.188**	
Helping others reduces my stress			-.177*

*$p < .05$, **$p < .01$, †$p < .001$

Table 3
Correlations between ratings of organizational concern and management of the COVID-19 pandemic with cultural dimensions

	PDI	IDV	MAS	UAI	LTO	IVR
Employer Concern	-.271†	.280†	-0.121	-.275†	0.029	0.11
Union Concern	-0.194	.416†	0.008	-0.154	0.121	-0.125
Regulator Concern	-0.056	0.02	-.182*	0.008	0.126	-0.071
Employer Management	-0.145	.144*	-0.091	-.158*	0.044	0.034
Union Management	-.312*	.346**	-0.14	-.271*	.283*	-0.14
Regulator Management	-0.112	-0.017	-.204**	-0.029	0.134	-0.022

*$p < .05$, **$p < .01$, †$p < .001$

Discussion Before Cultural Analysis

- This research gives strong evidence that The Flight Safety Foundation's *An Aviation Professional's Guide to Wellbeing* is an effective document for reducing stress and improving wellbeing among the aviation professionals participating in this survey.
  - The high internal reliability of the Wellbeing Index shows the strong connections between stress, wellbeing, coping with stress, and coping with the COVID-19 pandemic among the survey participants.
  - 15 of 17 stressors having significant correlations with the Wellbeing Index show the strength of work by Cahill, Cullen, & Gaynor, which informed the creation of the *Guide* (2019).
  - 4 of 11 activities suggested by the guide, all with positive relationships to the Wellbeing Index, show that most should find an activity in the guide that works for them.
  - The 7 activities that do not significantly correlate to the Wellbeing Index suggest that broad platitudes, such as, "Helping others will reduce your stress," will not work across all aviation professionals.
- Among tested organizational correlations with the Wellbeing Index, only Union Concern did not have a positive significant correlate.
  - Unions should investigate if their concern for the pandemic has a similar correlation with other populations.

Discussion After Cultural Analysis

- Hofstede's dimensions of national culture has significant positive and negative correlations with the stress and wellbeing index.
- These results match previous work studying 9400 pilots from 19 nations (Merritt, 2000), military pilots (Soeters & Boer, 2020), and air traffic controllers (Reader, Noort, Shorrock, & Kirwan, 2015; Noort, Reader, Shorrock, & Kirwan, 2016).
- Multiple significant correlations exist between cultural dimensions and the stressors and activities listed in the *Guide*.
  - While stressors have significant correlations with 5 of 6 cultural dimensions, individualism has by far the most correlations with activities proposed by the guide.
  - Listing activities that positively correlate with aviation professionals from collectivist nations may be beneficial.
- All tested ratings of organizational concern for and management of the COVID-19 pandemic had significant correlations with cultural dimensions., and all in the same direction for each dimension.
  - Organizations should consider national culture when responding to events such as the COVID-19 Pandemic.

References

Cahill, J., Cullen, P., & Gaynor, K. (2019, August 2). Pilots, interventions to support the management of work-related stress (WRS) and wellbeing/mental health issues for commercial. Cognition, Technology & Work. doi:10.1007/s10111-019-00586-z

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). Cultures and Organizations: Software of the Mind. McGraw-Hill.

Merritt, A. (2000, May). Culture in the cockpit: Do Hofstede's dimensions replicate? Journal of Cross-Cultural Psychology, 31(3), 283-301.

Nelson, H., Kremer, P., Anthony, T., Atherton, M., Cahill, J., Cullen, P., . . . Whittingham, D. (2020, April). An aviation professional's guide to wellbeing.

Noort, M. C., Reader, T. W., Shorrock, S., & Kirwan, B. (2016). The relationship between national culture and safety culture: Implications for international safety culture assessments. Journal of Occupational and Organizational Psychology, 89(3), 515-538. doi:10.1111/joop.12139

Reader, T. W., Noort, M. C., Shorrock, S., & Kirwan, B. (2015). Safety sans Frontières: An International Safety Culture Model. Risk Analysis, 35(5), 770-789. doi:10.1111/risa.12327

Soeters, J. L., & Boer, P. C. (2000). Culture and Flight Safety in Military Aviation. The International Journal of Aviation Psychology, 10(2), 111-133. doi:https://doi.org/10.1207/S15327108IJAP1002_1