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Blundell, J. & Kioulepoglou, P.
Published PDF deposited in Coventry University’s Repository

Original citation:

DOI 10.1080/24721840.2022.2071714
ISSN  2472-1840

Publisher: Taylor & Francis

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Impact of COVID-19 on Job Satisfaction: The Case of Military and Airline Pilots

Panagiotis Kioulepoglou and James Blundell

Faculty of Engineering, Environment and Computing, Coventry University, Coventry, UK; Institute of Future Transport and Cities, Coventry University, Coventry, UK

ABSTRACT
Objective: To investigate how the COVID-19 pandemic has affected the military and airline pilots’ Job Satisfaction (JS), and identify important contributory factors to support the development of future mitigating strategies.

Background: The aviation industry has undergone a series of devastating changes since the onset of the COVID-19 pandemic. Nonetheless, the implications of the pandemic on pilots’ JS are unknown.

Methods: Quantitative JS measurements were taken from 203 European and Middle Eastern pilots, during the pandemic (March, 2021), using the shortened Job Descriptive Index and Job In General validated scales. Follow-up semi-structured interviews (April 2021) were conducted with 16 participants to establish pre-pandemic JS levels and identify the degree of change due to COVID-19.

Results: Significant JS differences (p < .001) were observed between military and airline pilots; the former having higher levels. Qualitative findings revealed that airline pilots’ levels decreased due to factors such as job security, pay cuts, opportunities for promotion and skill fade concerns. Military pilots experienced an increased JS, as state-funded organizations were not substantially affected by COVID-19, which led to a feeling of appreciation and thankfulness.

Conclusion: COVID-19 has caused a major disruption to JS of military and airline pilots. Suggested mitigation measures for the civil aviation sector comprised effective communication between pilots and managers to reduce the pandemic-induced job uncertainty. Solutions such as extra flight simulator sorties were recommended to tackle the skill fade effect.

Introduction
Whilst the COVID-19 virus has made its presence known since the last months of 2019, it was not until April of 2020 that the devastating health consequences that were brought by the virus began to materialize on the global stage (Görlich & Stadelmann, 2020; Mihalca et al., 2021). Approximately, 2 years after the first pandemic wave (March 2022), the World Health Organization (WHO) had reported over 400 million infections, and approximately, 6 million officially counted casualties (World Health Organization [WHO], 2022).

Alongside the undeniably health-care crisis, the pandemic has caused a detrimental shock to economies and industries worldwide (Sun et al., 2021). Arguably, aviation does not constitute an exception, given that the International Air Transport Association (IATA)
referred to COVID-19 as “the largest shock to commercial air travel and aviation since World War II” (IATA, 2020b). Thereby, the airlines faced a 35–75% decline in capacity (Salman et al., 2020), and 25 million aviation-related jobs were at risk (IATA, 2020a). As a result, many airlines reverted to governmental financial support to avoid bankruptcy (IATA, 2020b) and applied several last-resort measures such as personnel lay-offs, furloughs, wage cuts and altering of work schedules (Melas & Melasova, 2020).

Undoubtedly, those measures’ influence on airline pilots’ Job Satisfaction (JS) is of major importance, considering that JS is a fundamental precursor of work performance, turnover, absenteeism and burnout rates (Fields, 2012). Nonetheless, most published research has focused on front line health professionals, i.e. nurses, doctors (Martínez-López et al., 2020; Que et al., 2020), whilst other COVID-19 affected professions have been mostly overlooked. Considering that airline pilots are the cornerstone of commercial flight safety (Harris, 2011), the necessity to conduct research concerning contributory and mitigating factors of JS during a crisis such as that of COVID-19, is urgent.

Similarly, minimal data exist to hypothesize whether the JS of military pilots has been impacted by the pandemic situation. Interestingly, before the onset of COVID-19, military pilots in many countries were leaving the army for a more favorable position in terms of salary and well-being in the airlines (Caraway, 2020); which was undoubtedly a sign of dissatisfaction (United States Department of Defense [DoD], 2019). Even though anecdotal evidence exist to assume that this transitioning-to-civil tendency has been temporarily halted (Everstine, 2020; IATA, 2021), it is believed that it is not a result of improved working conditions in the military, but possibly a reluctance to move to the civil sector due to the economic uncertainty that COVID-19 has introduced (Blustein & Guarino, 2020). Consequently, whilst the JS of military pilots was questionable before the onset of COVID-19, it is of paramount importance to determine its evolution during the pandemic, as this period of time might have introduced a psychological impact without precedent.

In this rationale, the first major hypothesis of this research is that the airline pilots might have experienced a significant decrease of their JS levels during the pandemic. On the other side, military pilots JS’ is questionable as no substantial changes due to COVID-19 were reported (Everstine, 2020; IATA, 2021). Consequently, the second major hypothesis of this research is that no significant changes have been caused as a result of the pandemic on this group of pilots.

Consequently, the aim of this study is to address the aforementioned knowledge gap by identifying how the COVID-19 pandemic has affected military and airline pilots’ JS, to identify which are the most important contributory factors of JS and describe remedial measures that could be taken to mitigate the JS effects of similar future crisis scenarios.

**Literature Review**

**The Value of Job Satisfaction**

One of the reasons that researchers have been so concerned with JS is its positive correlation with job performance, which usually varies between .10 and .30 (Alessandri et al., 2017; Schleicher et al., 2004). Interestingly, Jalagat (2017) supported that an even stronger relationship was found between JS and performance across many studies when team-based activities are involved. Thus, whilst flying is a team-based task, especially for the civil sector, the value of studying JS as a performance precursor, is justifiable.
Apart from performance, JS is also linked to absenteeism, which can be simply defined as the tendency of an employee to be absent from work without good reason (Badubi, 2017). Reportedly, a weak to moderate negative correlation has been established between JS and absenteeism; supported from a plethora of studies throughout the years (Burmeister et al., 2019; Naderi & Shams, 2020). Similarly, an even stronger relationship has been reported between JS and personnel retention rates of various organizations (Huang et al., 2017). Conclusively, a major meta-analysis, conducted by Carsten and Spector (1987), revealed a floating correlation between 0.18 and 0.52, which underpinned JS as a precursor of retention in almost every job context.

Lastly, occupational burnout has also been found to be negatively associated with JS (Kalliath & Morris, 2002). It is underlined that burnout is of major importance, as it often “co-exists” with organizational incidents and accidents (Genly, 2016; Nahrgang et al., 2011). Hence, it can be said that JS is a precursor to personnel’s well-being and organizational health (Newstrom, 2007); aspects crucial to safety-critical industries, such as aviation.

**Theories of Job Satisfaction**

JS drew significant attention in the mid-20th Century, which resulted in a bloom of relevant theories (Weiss & Merlo, 2015). Two theories with relevance to the current research include Maslow’s Hierarchy of Needs Theory (Maslow, 1943) and Adam’s Equity Theory (Adams, 1963). The former presents a theoretical framework describing how employees are influenced from JS factors through an individualistic approach, whereas the latter posits that the dynamics of an individual’s JS are driven through direct comparison with other employees (e.g., military vs airline pilots).

**Hierarchy of Needs Theory**

Maslow maintained that people are motivated to fulfil a high-level need e.g., a promotion, only when lower level needs (water, food, security, etc.) have been satisfied, known as the Hierarchy of Needs theory (Maslow, 1943). Correspondingly, organizational psychologists purported that JS is initially increased by satisfying everyday job-related needs, e.g., a decent salary (Khan et al., 2016). After those low-level objectives are accomplished, JS can be increased by moving upwards within the hierarchical framework e.g., promotions and fringe benefits (cf., Figure 1).

**Equity Theory**

Equity theory (Adams, 1963) outlines that employees’ JS is dependent upon contrasting themselves with the job outcomes of other comparable employees. That is, a perceived inequity in the employee’s cognizance is enough to trigger satisfaction or dissatisfaction, depending on the case (Adams, 1965). For example, by linking to the pilots’ case, a first officer who is promoted to captain earlier than usual, is a cause for dissatisfaction to their colleagues; and a cause for satisfaction to himself/herself.
The stress that COVID-19 has induced in employees is globally acknowledged (Horesh & Brown, 2020; Miron et al., 2021). Nonetheless, the impact of this stress differs according to the coping strategies of the individual (Guerrero & Ramos, 2015). This means that different employees may be exposed to the same stressors but be unequally affected as a result of personal stress resistance, which is usually referred to as Resilience-to-stress – in the literature (Wilks, 2008).

Furthermore, JS is a psychological construct substantially affected by stress (Dua, 1994). Indeed, except for a direct relationship between stress and job dissatisfaction, other studies have supported additional adverse outcomes such as burnout and turnover (Um & Harrison, 1998), along with decreased organizational commitment (Darwish, 2002). Interestingly, these studies have pinpointed role ambiguity and job role conflict as the main stressors affecting JS; a form of stress that is likely to be prevalent during a pandemic such as COVID-19.

Consequently, Resilience-to-Stress should be taken into consideration where JS is being examined in different groups of employees, e.g., military and airline pilots. In this rationale, differences in the occupational background may play a moderating role in the impact of stress on individuals. For example, a major difference in the training that an employee has undergone, e.g., Captain versus First Officer, may allow them to react differently to stressful situations and thus, result in unequal influence on their JS levels. For this reason, it was deemed necessary for this study to measure not only the JS levels of participants, but also those of resilience, as an extra way to ensure validity.

At this point, the literature review section is completed. The following section deals with the applied methods (quantitative and qualitative) to collect and analyze data. Following methods, a thorough illustration of results and a discussion of those takes place, whereas the last section of this study is consisted of major conclusions.
Research Methodology

The present study employs a mixed-methods design to explore the perceived JS levels of military and airline pilots before and during the COVID-19 pandemic period. Initially, quantitative questionnaires were used to capture the current (March, 2021) JS and Resilience-to-Stress levels of pilots. Semi-structured follow-up interviews were conducted with the sub-set of the pilot participant samples (April, 2021) in order to explicate the influence that the pandemic has had on pilots’ current JS, based on participants’ recall of past JS levels before the onset of the pandemic.

Quantitative Measures

The shortened – “abridged” – version of the Job Descriptive Index (aJDI) and Job In General (aJIG) scale (hereinafter referred to as aJDI/aJIG when combined) was selected as the optimal means of objectively measuring JS. Participants’ Resilience-to-Stress was measured using the shortened Response to Stressful Events Scale (RSES-4).

Job Satisfaction Scales

The aJDI/aJIG, developed by Smith et al. (1969), has seen many modifications up until the most recent version by the Bowling Green State University (2009). The current version of the aJDI consists of 30 items on five facets: Work, Supervision, Promotions, Coworkers and Pay. The aJIG comprises another eight items, which focus on overall JS levels, resulting in 38 items in total on the aJDI/aJIG.

Preference of the aJDI/aJIG was due to it demonstrating high levels of reliability and validity among validated JS scales (cf., Fields, 2012), as well as having high internal consistency across facets (Kinicki et al., 2002). The shortened “abridged” version of aJDI/aJIG has demonstrated similar levels of reliability and validity to those found in the full version (Spector, 2012; Stanton et al., 2002). Furthermore, a validated Greek translation of the aJDI/aJIG exists (Tasios & Vaitsa, 2017), which was suited to the large proportion of Greek participants within the current sample.

The scoring of aJDI/aJIG is based upon participant agreement ratings of how well statements or words describe aspects of their work environment. For instance, on the Supervision facet participants are required to rate statement such as “praises good work.” Agreement ratings are recorded on a 3-point scale: No (0), ? (1) and Yes (3). Separate JS facet scores are calculated by summing facet item scores. In the current study, facet scores were transformed into percentages for easier interpretation of results across measures.

Resilience-to-Stress Scale

The RSES-4, a 4-item Resilience-to-Stress scale, was included to establish whether JS differences between pilots might result from increased/reduced Resilience-to-Stress of the individual. Similarly, to aJDI/aJIG scale, RSES-4 has demonstrated high levels of internal consistency given its limited number of items, which fluctuates around 0.75–0.78 (De La Rosa et al., 2016). Also, test–retest reliability (r = .50, p < .001) and strong correlations with various validated psychological scales (mainly scales measuring stress), have confirmed its high levels of validity (De La Rosa et al., 2016).
The RSES-4 scale implements Likert-type scores ranging from 0 (minimum possible resilience) to 4 (maximum possible resilience), resulting in a final score between 0 and 16. Final scores were converted into percentages to facilitate easier comparison of the results.

**Qualitative Measures**

The development of the majority of the semi-structured interview questions was based on previous JS research (Bussing et al., 1999; Dukes-Robinson & Esmail, 2014; Welter, 2017) to: (1) identify JS factors that were not captured in the previous questionnaire, (2) compare the JS of the participants before and during the COVID-19 period, and, (3) identify possible remedial measures. Examples of the semi-structured interview questions are available below, whereas a thorough schedule is provided in Appendix A.

- “Try to recall the satisfaction you were receiving from your job before the onset of the COVID-19 pandemic. Do you receive more or less now, compared to that period of time? Which were the most significant factors to this change?”
- “As far as you can recall, if you were given the same questionnaire before the COVID-19 outbreak, would your responses be different? Positive or negative?”

Due to the nature of the semi-structured interview, a unique combination of questions, probes and prompts, was shaped for every participant. Additionally, because military and airline pilots were found to have major differences between them – in terms of JS – some questions could not apply to the other group and *vice versa*. Nonetheless, all interviews followed a four-phase cycle, which included (1) introductory questions, (2) questions regarding JS factors identification and comparison between time-periods, (3) questions aiming at mitigation measures identification, and (4) closing questions.

**Participants**

The quantitative phase included a cross-sectional sample, composed of military (*N*<sub>MIL</sub> = 100) and airline (*N*<sub>ARL</sub> = 103) pilots, whereas 16 of them – equal samples – participated in the qualitative part as well (Table 1).

Minimum criteria for participation comprised a current professional pilot’s license (airlines or military) which also ensured an adequate degree of familiarity with the English language. Also, the participant was required to have been working as a pilot prior and during the pandemic, so as to facilitate a comparison for the study’s requirements. Recruiting techniques included purposive sampling, based on the professional contacts of the author. Unsurprisingly, participation of female pilots was limited; as women constitute a minority – of around 5% – in pilots’ population (Germain et al., 2012). All participants gave explicit consent regarding their voluntary participation only by electronic means due to COVID-19 health restrictions. All collected data were securely held and analyzed, according to British Psychological Society’s guidelines.
Procedure and Analysis

Quantitative Phase
From the 312 sent invitations, 203 were responded (65% response rate). Of those, 10 random participants were chosen to test the entire questionnaire (pilot run) for any comprehension-induced bias. After minor formatting inconsistencies were addressed, the main data gathering took place, which lasted 16 days. No missing cases or invalid inputs were observed. Questionnaire data were organized and analyzed with SPSS v.25 syntax code and independent t-tests were applied to identify significant differences between military and airline pilots. The use of independent t-tests was deemed appropriate as the dataset met the necessary parametric assumptions (Field, 2018) and the dataset consisted of large and equivalent group sizes ($N_{\text{MIL}} = 100$, $N_{\text{ARL}} = 103$). An alpha value of .001 (two-tailed) was deemed appropriate given that multiple independent t-test analyses were required.

Qualitative
All interviews were conducted remotely via video conferencing software as a COVID-19 protective measure for participants during the pandemic. Furthermore, all interview sessions were scheduled as soon as practical after the completion of the quantitative data collection, so as to maximize participants’ recall on interview questions that were associated

Table 1. Sociodemographic characteristics of participants.

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Military only</th>
<th>Airlines only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 203</td>
<td>$N_{\text{MIL}} = 100$</td>
<td>$N_{\text{ARL}} = 103$</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>201 (99.0%)</td>
<td>99 (99.0%)</td>
<td>102 (99.0%)</td>
</tr>
<tr>
<td>Female</td>
<td>2 (1.0%)</td>
<td>1 (1.0%)</td>
<td>1 (1.0%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–25</td>
<td>30 (14.8%)</td>
<td>20 (20.0%)</td>
<td>10 (9.7%)</td>
</tr>
<tr>
<td>26–30</td>
<td>43 (21.2%)</td>
<td>25 (25.0%)</td>
<td>18 (17.5%)</td>
</tr>
<tr>
<td>31–35</td>
<td>42 (20.7%)</td>
<td>25 (25.0%)</td>
<td>17 (16.5%)</td>
</tr>
<tr>
<td>36–40</td>
<td>35 (17.2%)</td>
<td>17 (17.0%)</td>
<td>18 (17.5%)</td>
</tr>
<tr>
<td>41–45</td>
<td>20 (9.9%)</td>
<td>6 (6.0%)</td>
<td>14 (13.6%)</td>
</tr>
<tr>
<td>46–50</td>
<td>17 (8.4%)</td>
<td>5 (5.0%)</td>
<td>12 (11.7%)</td>
</tr>
<tr>
<td>51–55</td>
<td>10 (4.9%)</td>
<td>2 (2.0%)</td>
<td>8 (7.8%)</td>
</tr>
<tr>
<td>56–60</td>
<td>5 (2.5%)</td>
<td>0 (0.0%)</td>
<td>5 (4.9%)</td>
</tr>
<tr>
<td>60+</td>
<td>1 (0.5%)</td>
<td>0 (0.0%)</td>
<td>1 (1.0%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>87 (42.9%)</td>
<td>51 (51.0%)</td>
<td>36 (35.0%)</td>
</tr>
<tr>
<td>Married</td>
<td>110 (54.2%)</td>
<td>47 (47.0%)</td>
<td>63 (61.2%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>6 (3.0%)</td>
<td>2 (2.0%)</td>
<td>4 (3.9%)</td>
</tr>
<tr>
<td>Parental Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Children</td>
<td>104 (51.2%)</td>
<td>60 (60.0%)</td>
<td>44 (42.7%)</td>
</tr>
<tr>
<td>One or more</td>
<td>99 (48.9%)</td>
<td>40 (40.0%)</td>
<td>59 (57.3%)</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>41 (20.2%)</td>
<td>19 (19.0%)</td>
<td>22 (21.4%)</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>118 (58.1%)</td>
<td>57 (57.0%)</td>
<td>61 (59.2%)</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>41 (20.2%)</td>
<td>22 (22.0%)</td>
<td>19 (18.4%)</td>
</tr>
<tr>
<td>PhD or Higher</td>
<td>3 (1.5%)</td>
<td>2 (2.0%)</td>
<td>1 (1.0%)</td>
</tr>
<tr>
<td>Instructor*</td>
<td>82 (40.4%)</td>
<td>44 (44.0%)</td>
<td>38 (36.9%)</td>
</tr>
<tr>
<td>Tenure, Mean (SD)</td>
<td>10.37 (7.46)</td>
<td>13.28 (7.81)</td>
<td>7.54 (5.89)</td>
</tr>
</tbody>
</table>

*Reflects the number and percentage of participants answering “Yes” (being instructors).
with the questionnaire items. Interviews were taken either in English or Greek, according to the preference of the participant. Specifically, Greek transcripts were translated in English by the author, prior to analysis, whereas the English ones were verbatim.

Analysis was conducted according to Braun’s and Clarke’s thematic analysis six-step guide (Braun & Clarke, 2006). After a thorough reading of the formed transcripts, an initial set of codes was developed. Final themes, categories, and codes resulted from an iterative three-cycle process, aiming not only in the quantitative recurrence (repetitions) of the codes, but also in the qualitative magnitude of those, usually defined in the literature as prevalence (Guest et al., 2020). Triangulation was applied through cross-coding procedures with the coauthor to ensure valid interpretation of the participants’ views (Figure 2).

**Results**

**Quantitative Phase**

Mean aJDI/aJIG and RSES-4 scale scores are presented in Table 2 and Figure 3. The internal consistency (Cronbach α) of the aJDI/aJIG, averaged at .76 across the scales/facets (see Appendix C, Table C1 for explicit values), which was considered satisfactory.

Clear differences were observed between military and airline pilots on the majority of aJDI/aJIG facets. This included a large difference on the aJIG facet, whereby military pilots demonstrated higher general JS levels (mean: 82.33, SD: 17.37) than airline pilots (mean: 43.73, SD: 23.36). This difference was echoed on the majority of more specific aJDI/aJIG facets, predominantly the Promotions, Pay and Work facets where the observed effect sizes
were large (Table 2). Supervision facet differences between military and airline pilots were smaller, yet still significant. In contrast, on the aJDI/aJIG Coworkers facet and the RSES-4 no significant differences between military and airline pilots were revealed.

**Qualitative Phase**

A total of 116 codes, 20 categories and four overarching themes were formed as a result of thematic analysis across 16 military and airlines participants’ transcripts. The four themes included, (1) The Impact of COVID-19, (2) Contributory Factors, (3) Mitigation Measures and (4) Back-up Plan as a JS Mediator. The first three of them were considered the most critical ones, due to their direct association with the project’s research questions i.e. explanation of COVID-19 impact on pilots’ JS, identification of JS factors and mitigation measures. Nonetheless, the fourth theme is discussed here due to its indirect association with the explanation of the project’s findings (for a thorough illustration of Thematic Analysis rationale see Appendix B).

**Table 2.** Descriptive statistics of job satisfaction and resilience scales.

<table>
<thead>
<tr>
<th>Scale/Facet</th>
<th>Military M</th>
<th>SD</th>
<th>Airlines M</th>
<th>SD</th>
<th>t-statistic</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIG</td>
<td>82.33</td>
<td>17.37</td>
<td>43.73</td>
<td>23.36</td>
<td>.000*</td>
<td>13.33</td>
<td>1.87</td>
</tr>
<tr>
<td>Supervision</td>
<td>68.61</td>
<td>25.56</td>
<td>54.26</td>
<td>20.75</td>
<td>.000*</td>
<td>4.40</td>
<td>0.62</td>
</tr>
<tr>
<td>Promotions</td>
<td>60.50</td>
<td>25.50</td>
<td>17.80</td>
<td>15.70</td>
<td>.000*</td>
<td>14.41</td>
<td>2.02</td>
</tr>
<tr>
<td>Pay</td>
<td>66.28</td>
<td>24.01</td>
<td>16.29</td>
<td>21.34</td>
<td>.000*</td>
<td>15.69</td>
<td>2.20</td>
</tr>
<tr>
<td>Work</td>
<td>78.89</td>
<td>21.98</td>
<td>39.21</td>
<td>23.66</td>
<td>.000*</td>
<td>12.37</td>
<td>1.74</td>
</tr>
<tr>
<td>Coworkers</td>
<td>79.56</td>
<td>23.34</td>
<td>80.42</td>
<td>18.62</td>
<td>.770</td>
<td>−0.29</td>
<td>−0.04</td>
</tr>
<tr>
<td>RSES-4</td>
<td>82.50</td>
<td>15.87</td>
<td>80.95</td>
<td>16.05</td>
<td>.489</td>
<td>0.69</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Df = 201. *p < .001, two tailed (α = .001).
Theme 1: The Impact of COVID-19
The results demonstrated major differences between military and airline pilots. Surprisingly, military pilots experienced an increase in their JS levels during the pandemic even though the nature of their working environment was not substantially affected from COVID-19, as a result of permanent support between the military organizations and the governments. Participant “Nestor,” a 32-year-old military pilot from Italy, said, “No, there are no major changes. I could say that a change may be the health precautions and restrictions that were caused due to COVID-19, but this is [sic] a minor one . . . ” Nonetheless, this increase was later explained by the fact that many of them (six out of eight, 75%) felt “grateful” and thus, “appreciated” their employment circumstances by comparing themselves with their colleagues in the civil sector. Participant “Aris,” a 31-year-old military pilot from Greece, in reply to the question “why your JS went up during the pandemic?” concluded:

By comparing ourselves with other organizations . . . organizations that were so much affected from the COVID-19 consequences . . . and many employees losing their jobs . . . or getting a salary shrinkage . . . made me consider how stable and resilient is my job to situations like these . . . made me feel how lucky I am on this job . . .

Admittedly, the majority (six out of eight, 75%) of military participants argued that if the aJDI/aJIG questionnaire was given to them before the onset of the COVID-19 pandemic, they would have put lower scores on Pay, JIG and Work scale/facets because at that time they were considering these aspects of their job to be much worse than those of their colleagues in the civil sector. Notably, all military participants supported that prior to the pandemic, the perspective of switching to the civil sector was apparent, whereas all of them ceased to consider such an option after the onset of the pandemic.

On the contrary, airline pilots experienced a substantial decrease in their JS levels during the pandemic as a result of decreased flying hours, benefit/salary cuts and lay-offs of colleagues, which led to the manifestation of job insecurity/uncertainty stressors. Interestingly, most of them (six out of eight, 75%) maintained that they would advise any newcomers to join the airlines, “only when the pandemic is over” and “things are back to normal.” Participant “Kronos,” a 37-year-old airline pilot from United Kingdom, said, “I would tell him to postpone it and get back when the COVID consequences are eventually over.” In this rationale, when airline pilots were asked how they would have responded to the aJDI/aJIG if it was given to them prior to the pandemic, 75% mentioned higher scores to the Pay, JIG, Work and Promotions scale/facets.

Theme 2: Contributory Factors
aJDI/aJIG facets such as Pay, JIG, Work and Promotions were also confirmed by the interviewees as major JS factors during the pandemic. Apart from these, two additional JS factors were identified that the aJDI/aJIG was unable to capture. The majority of participants (75% of military and 75% of airline pilots) reported Job security as the dominant factor, causing a decrease and increase to airline and military pilots’ JS, respectively. Interestingly, participant “Saturn,” a 47-year-old airline pilot, cited a series of concerns, the majority of which were directly associated with Job Security: “There is a whole new array of stressors. Will I get fired? Will I make the ends meet? Will I be able to make it through the month with the money I am getting?”
Additionally, abstention from flights (described as skill-fade) was one of the most important reasons that airliners’ JS shrunk during the pandemic. Participant “Pluto,” a 44-year-old airline pilot from Greece, maintained that: “I haven’t seen a significant drop of my performance but every time I enter the cockpit I feel like a stranger, and this is a reason to not being able to enjoy the flight like I used to do . . . .” Also, two airline pilots argued that less congested airspace and increased free time were factors that acted positively regarding their JS levels during the pandemic.

**Theme 3: Mitigation Measures**
Airline pilots recognized that limited actions can be taken to maintain high levels of JS during the pandemic. Nonetheless, according to their arguments, the most critical “game-changer” is the establishment of an effective communication between the company and the pilots. Participant “Uranus,” a 51-year-old airline pilot, commented the following:

Yes . . . So the managers should give all the information to people so that they can take back some control of their lives . . . and when you have control of your life, then your stress levels would be going [sic], and then your job satisfaction will go up again.

Specifically, airline pilots want to have a holistic picture of the situation and future actions of the company in order to adjust their course of action accordingly. According to them, this could reduce the levels of uncertainty substantially. Furthermore, many of them referred to the skill-fade effect, which can be mitigated in many ways such as extra flight simulator sorties, augmented air crew operations and flight as observers. On the contrary, no mitigation measures were reported from the military pilots, as none of them experienced a significant drop of JS during the pandemic.

**Theme 4: Back-Up Plan as a JS Mediator**
As mentioned earlier, 75% of airline pilots maintained that they would have given higher scores to Pay, JIG, Work and Promotions scale/facets, if asked before the onset of COVID-19. An exception to this “rule” were two cases of airline pilots who reported no change of their JS between these two time periods as a result of the existence of a “backup plan.” Participant “Hermes,” a 38-year-old airline pilot from Greece, supported that “It’s one of the best jobs in the world in my opinion. I absolutely love it, but you just gotta [sic] kind of make sure that you’ve got a backup plan in place because. You know?”

Their “backup plan” was typically a second source of income or an occupational alternative that those individuals had, which acted as a mitigation measure to the uncertainty/job insecurity that the COVID-19 conjuncture introduced. In this way, participants were not afraid of pay cuts or redundancy, as their income was insured, and their uncertainty about the future – at least financially – was not increased.

**Discussion**
The difference between military and airline pilots in terms of JS was of large and significant effect. In addition, qualitative findings supported that this difference was a result of the COVID-19 consequences. Indeed, military organizations were not affected from COVID-19 financial consequences (as most of them are funded directly from the state). This fact
allowed military pilots to experience subtle changes in their working routine e.g., the compulsory measure of wearing masks. A summary of the mixed-methods results is illustrated in Table 3:

One of the most important inferences of this study lies in the fact that JS is dependent upon comparison of the employees with their colleagues, which is a fundamental premise of the Equity Theory (Adams, 1963, 1965; Al-Zawahreh & Al-Madi, 2012). Qualitative results pinpointed this tendency amongst pilots, not only inside the given organization, but most importantly, outside of it. For example, military pilots had high awareness of the situation in the airlines; this fact explained, according to them, the rise of their JS levels during the pandemic as a result of “self-comparing.” It also halted their interest in civil aviation, even on a temporary basis. Consequentially, anecdotal speculations that claimed a temporary reluctance of military pilots to move to the airlines due to COVID-19 economic disruption (Pawlyk, 2021; Switzer, 2020), are generally supported.

A critical point regarding the interpretation of the results is the Resilience-to-Stress construct as a moderating factor. It would be reasonable to assume that because military pilots have undergone a considerable degree of combat training, their Resilience-to-Stress levels may be superior to those of airline counterparts (Taylor et al., 2011), leading to a reduced influence from the aforementioned pandemic-induced stressors. Nonetheless, RSES-4 scale’s quantitative results showed that demonstrated JS differences were not a result of Resilience-to-Stress dissimilarities between military and airline pilots. Interestingly, an absolute absence of effect and significance was found between the two pilot groups. This means that differences in pilots’ JS levels were not moderated from the Resilience-to-Stress factor, which increases the reliability of this study’s inferences substantially.

Certain factors that led to the decrease of airline pilots JS during the pandemic can be found at the lower levels of Maslow’s Pyramid. Namely, Pay and Job Security are positioned at the second level (Safety), which renders them essential for the perseverance of employees’ JS (Figure 1). Unsurprisingly, the majority of airline pilots pinpointed the importance of these two factors in the shaping of their JS throughout the pandemic. Nonetheless, there was a considerable amount (25%) who claimed no change in their JS levels in both the quantitative and qualitative approaches of this study. Closer examination of participants’ views revealed that this portion of participants had a “back-up plan”
to protect against the possible scenario of losing their pilot jobs, e.g., a second job/an investment, etc., to secure their income. This alternative was enough to maintain a substantial degree of security during the pandemic and avert a significant JS decrease, as it was observed in the rest of the airline pilots.

**Conclusion**

This study concluded that the COVID-19 pandemic has caused a large decrease to JS levels of airline pilots. The most important contributory factors were the job per se (aJIG scale, Work facet and Skill-Fade factor), Pay, Promotions and Job Security. Measures to mitigate JS in airline pilots were identified through semi-structured interviews with participants. Primary measures included establishing an effective communication network between the company and the employees to minimize the uncertainty that crises such as the pandemic entail. According to participants, this communication should clarify impending actions of the organization, e.g., furloughs or lay-off strategies, to allow for a more effective “life-planning” of the employees and to reduce their psychological uncertainty levels. Secondly, proper countermeasures to minimize the Skill-Fade effect include augmenting crew operations, increasing flight simulator sorties and “flights as observers.” The fear of possible reduced performance in the aircraft was a major factor of JS drop of the airline pilots, and it is imperative that further actions be taken by the airlines in order to mitigate further JS drop in the future.

As for the military pilots, the increase of their JS levels during the pandemic was justified as a result of comparison between themselves and the airline pilots. Anecdotal claims regarding a temporary halt of the transition-to-airlines tendency – of the military pilots – were supported. It can be speculated that by the end of the COVID era, JS levels of the military pilots might return to previous levels.

**Future Research Perspectives**

Despite the fact that JS is considered a “saturated” construct by many authors (Culibrk et al., 2018; Spector, 2012) in terms of research, this project revealed many critical points contributing to a more integrated theoretical framework regarding aviation psychology. It is reasonable to posit that the study’s findings resulted from the novelty of the COVID-19 pandemic period. Thus, it is envisaged that theories or axioms considered “saturated” or “exhausted” in terms of research in the past, may yield unexpected results when concepts like JS are challenged by unique circumstances and crises. Consequently, the need for further research within considered such-fields of organizational research, such as, motivation, organizational commitment, engagement, etc., is urgent.

Finally, special attention should be given to the JS levels of the military pilots. According to this project’s results, it can be hypothesized that after the consequences of the COVID-19 pandemic have abated, military pilots JS’ levels will return to normal. Apart from the aforementioned consequences on JS, this transition may also trigger a new “transition-to-civil” wave of military pilots with serious implications on pilot retention rates; an issue that cause concern to many Air Forces worldwide (Caraway, 2020).
**Limitations**

Since military pilots from several countries, namely, Greece, Cyprus, Egypt, Jordan, Italy, Montenegro, etc., have participated, results are by no means representative of any particular military/country. Similarly, pilots from various airlines of Europe and the Middle-East have taken part, which rendered the whole study unrepresentative of any specific organization. Also, by taking into account that there was no possibility of a sampling frame, generalizability of the results constitutes a limitation of this study.

**Disclosure Statement**

No potential conflict of interest was reported by the author(s).

**ORCID**

Panagiotis Kiouleoglou http://orcid.org/0000-0002-3796-8459
James Blundell http://orcid.org/0000-0002-4029-0773

**References**


Appendix

Weiss, Um, Taylor, Tasios, Switzer, 2008, 2022 (12),


Appendix A

Interview Schedule

• Tell me about your current job in general. What are some of the duties of your current position?
• Try to recall the time period before the onset of COVID-19, namely, before February 2020. Have you noticed any changes regarding your duties since that period of time? Which were the most significant?
• Try to recall the satisfaction you were receiving from your job before the onset of the COVID-19 pandemic. Do you receive more or less now, compared to that period of time? Which were the most significant factors to this change?
• As far as you can recall, if you were given the same questionnaire before the COVID-19 outbreak, would your responses be different? Positive or negative?
• Are there any advantages or disadvantages in your job that occurred as a result of the COVID-19 pandemic? Name the top three (3), if any . . . and explain.
• If a good friend told you she/he would be interested in a job like yours, what would you tell them? What would you tell them if he or she was asking prior to the COVID-19 pandemic?
• How do you see your career or your job developing from this point onwards? According to your judgment as an expert, how important is for the Airforce/Airlines [delete as appropriate] to overcome the COVID-19 issue?
• What, if anything, could be done to increase your Job Satisfaction levels during this challenging period (of COVID-19)?
• Do you have anything else to propose? Any specific or general comments regarding this topic?
Appendix B
Thematic Coding

Group Codes of the Military Group in Arithmetic Hierarchical Order

Thematic map of the military group; created using Atlas.ti software
Group codes of the airlines group in arithmetic hierarchical order

Thematic map of the airlines group; created using Atlas.ti software
Appendix C
Miscellaneous

Table C1. Internal consistency table of JDI (all facets included), JIG and RSES-4 scales.

<table>
<thead>
<tr>
<th></th>
<th>JIG</th>
<th>Supervision</th>
<th>Promotions</th>
<th>Pay</th>
<th>Work</th>
<th>Coworkers</th>
<th>RSES-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach $\alpha$</td>
<td>.849</td>
<td>.617</td>
<td>.816</td>
<td>.870</td>
<td>.774</td>
<td>.692</td>
<td>.718</td>
</tr>
</tbody>
</table>

Cronbach $\alpha$ is calculated for the entire sample ($N = 203$) as it measures internal consistency of the entire instrument. It can be said that 62–87% (overall) of the variability (of the answers) can be attributed to internal consistent (true) variance, which is considered satisfactory, given the limited number of items in each facet/scale (four to eight; Trevethan, 2009, p. 465).