

**Assignment Letter/Surat Tugas**

**No.** : ASL/IBA/0781/IULI/I/2022 **Date/Rev.** : 31 January 2022/ 00  
**From /Dari** : Head of Department of International Business **Page** : 1 of 1  
Administration / *Kepala Program Studi* **Doc Type** : Main Document  
**To / Kepada** *Administrasi Bisnis Internasional*  
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**Duty Assignment / Tugas melaksanakan kegiatan**

<b>Assignment At</b> <b>INTERNATIONAL UNIVERSITY LIAISON INDONESIA</b>	<b>Penugasan di</b> <b>UNIVERSITAS LINTAS INTERNASIONAL INDONESIA</b>
Head of Department of IBA of International University Liaison Indonesia <b>In consideration of:</b> His appointment as the Head of Department of IBA of International University Liaison Indonesia under agreement Nomor SK/REC/0671/IULI/XI/2021	<i>Kepala Program Studi IBA Universitas Lintas Internasional Indonesia</i> <b>Mengingat:</b> <i>Pengangkatannya sebagai Kepala Program Studi IBA Universitas Lintas Internasional Indonesia dibawah perjanjian Nomor SK/REC/0671/IULI/XI/2021</i>

Herewith gives the task to:

*Dengan ini menugaskan kepada:*

Name: **Dr. Samuel PD Anantadjaya**  
Position: **Lecturer**

*Nama: **Dr. Samuel PD Anantadjaya***  
*Jabatan: **Dosen***

To provide the following activity:

*Untuk mengikuti kegiatan:*

No	Task/Tugas	Article/Artikel	SKS	Period/Periode	Journal/Jurnal
1.	Article Reviewer	Manuscript ID D-22-01252 entitled "A Study on Sustainable Air-Travel Behaviour under the Possible Remedy of Risk Knowledge: A Mediating Perspective of Risk Perception during COVID-19"	1	31 January – 14 February 2022	invited by: Martin Thomas Falk, PhD Heliyon (Scopus-Based Journal Q1) ISSN # 2405-8440 (online)
<b>Total SKS</b>			<b>1</b>		

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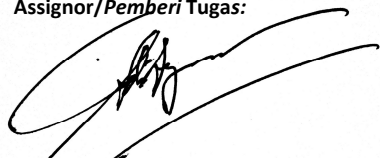
If the fasilitator full for 3 day activity, the calculation of SKS is 3 day x 8 hour= 24 hour, plus preparation ± 12 hour, then the workload is  $\{[(3 \text{ day} \times 8 \text{ hour}) + (12 \text{ hour})] / 50 \text{ hour}\} \times 1 \text{ SKS} = 0.72 \text{ SKS}$

*Jika fasilitator penuh untuk satu kegiatan selama 3 hari, maka perhitungannya menjadi 3 hari x 8jam, ditambah dengan persiapan ± 12jam maka beban kerja menjadi  $\{[(3 \text{ hari} \times 8 \text{ jam}) + (12 \text{ hari})] / 50 \text{ jam}\} \times 1 \text{ SKS} = 0.72 \text{ SKS}$*

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**Assignor/Pemberi Tugas:**



**Ida Bagus Putu Aditya, ST., MM.**  
*Kepala Program Studi IBA / Head of Department of IBA of International University Liaison Indonesia*

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S A M &lt;ethan.eryn@gmail.com&gt;

**Invitation to review manuscript for Heliyon - Reminder**

1 message

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January 31 - Feb 14, 2022

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Reply-To: Heliyon &lt;info@heliyon.com&gt;

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Manuscript Number: HELIYON-D-22-01252

Title: A Study on Sustainable Air-Travel Behaviour under the Possible Remedy of Risk Knowledge: A Mediating Perspective of Risk Perception during COVID-19

Dear Dr Anantadjaya,

We recently invited you to review the above-referenced manuscript for Heliyon, an open access journal that is part of the Cell Press family. This is a friendly reminder asking for a response to our invitation. As you are an acknowledged expert in the field, we would greatly appreciate your contribution. Please find the abstract of the manuscript below.

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**Abstract:**

The aviation industry is the centre of gravity for tourism-dependent countries to uplift economic activities. The COVID-19 pandemic in the early part of 2020 threatened people and the air industry to the maximum extent. This paper investigated the sustainable air-travel behaviour of passengers under the risk knowledge path. The mediating role of risk perception, i.e., physical risk, psychological risk and service quality, is also being tested on the risk knowledge-air travel behaviour association. We surveyed 339 travellers at six airports in Thailand from January to June 2021 to record their responses. We applied structural equation modelling (SEM), and the study results revealed a direct effect of risk knowledge along with an indirect effect via risk perception paths on air-travel behaviour. This paper highlighted knowledge as a remedial answer for the perceptual make-up for the sustainability of air services. The study has strong managerial implications for aviation management to design ideal pathways to retain air services on board during the current public emergency of COVID-19.

Keywords: Sustainable air-travelling behaviour; Physical risk; Psychological risk; Risk knowledge; Service quality; Structure equation modelling

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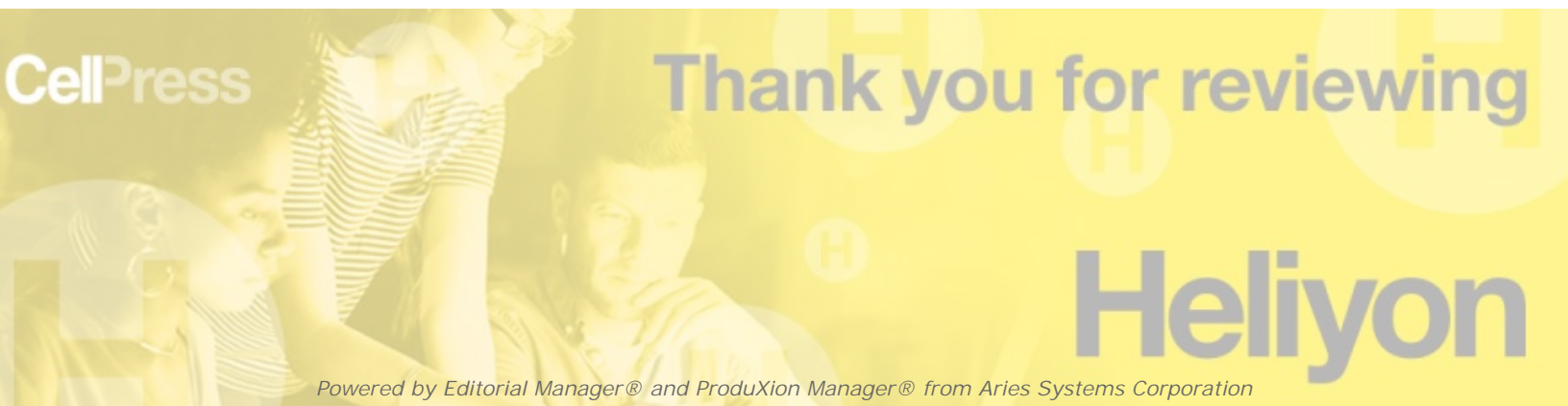
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# Heliyon

## A Study on Sustainable Air-Travel Behaviour under the Possible Remedy of Risk Knowledge: A Mediating Perspective of Risk Perception during COVID-19 --Manuscript Draft--

<b>Manuscript Number:</b>	HELIYON-D-22-01252
<b>Article Type:</b>	Original Research Article
<b>Section/Category:</b>	Business and Economics
<b>Keywords:</b>	Sustainable air-travelling behaviour; Physical risk; Psychological risk; Risk knowledge; Service quality; Structure equation modelling
<b>Abstract:</b>	<p>The aviation industry is the centre of gravity for tourism-dependent countries to uplift economic activities. The COVID-19 pandemic in the early part of 2020 threatened people and the air industry to the maximum extent. This paper investigated the sustainable air-travel behaviour of passengers under the risk knowledge path. The mediating role of risk perception, i.e., physical risk, psychological risk and service quality, is also being tested on the risk knowledge-air travel behaviour association. We surveyed 339 travellers at six airports in Thailand from January to June 2021 to record their responses. We applied structural equation modelling (SEM), and the study results revealed a direct effect of risk knowledge along with an indirect effect via risk perception paths on air-travel behaviour. This paper highlighted knowledge as a remedial answer for the perceptual make-up for the sustainability of air services. The study has strong managerial implications for aviation management to design ideal pathways to retain air services on board during the current public emergency of COVID-19.</p>



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Received: date; Accepted: date; Published: date

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## Introduction

Passenger travel behaviour changed dramatically during the COVID-19 pandemic. Aviation management calls for perceptual positioning of the passenger as a remedial tool for sustained travel demand [1]. The enduring damage continues to rise in tourism, transport, catering, entertainment and retail due to COVID-19. People perceive the current pandemic as a physical threat, employment loss, home-to-home disease transmission, suffering and death [2,3]. In the initial three-month phase, a 70% to 95% decline in passenger demand was borne by the aviation industry with passenger traffic disruptions [4,5]. However, decades of sustainable growth have been the working story of the aviation industry, even in the 2001 terrorist event of 9/11 and the 2008 global economic depression. The aviation industry enjoyed a persistent pace in annual travelling demands of up to 4.5% [6]. Historically, H1N1 and SARS diseases captured the domestic and global stature of air travel, which is also the current case of public emergency in COVID-19. The outbreak of the new coronavirus at the start of 2020 put all of China in isolation, not only the people but also industry [7]. As the outbreak spread, a variety of industries came under enormous pressure of COVID-19 in China and globally.

Thailand, as a neighbouring country, also came in contact with COVID-19 in January 2020. Thousands of travellers use Thai airports to return home, which gave birth to the virus in the country. The outbreak of the pandemic dramatically declined air traffic in Thailand, and the passenger volume and aircraft movement decreased by 55.78% and 67.39%, respectively [8].

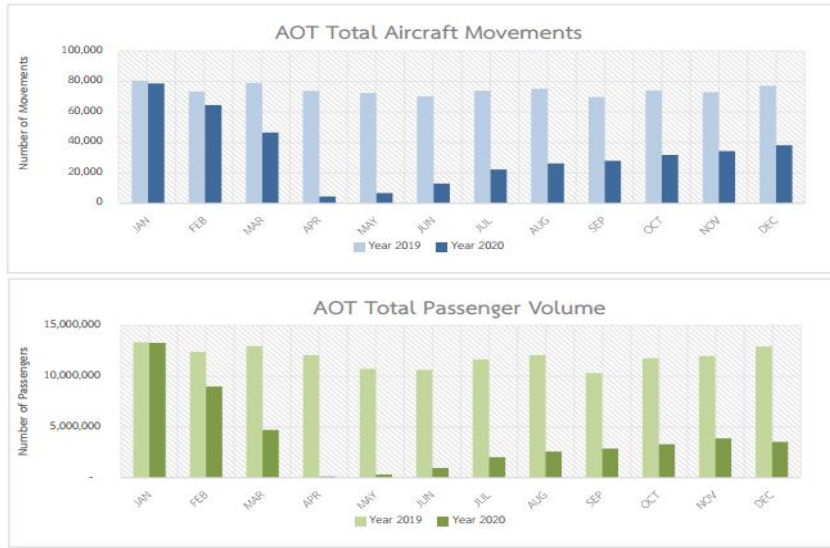


Figure 1 Comparative Position of Aircraft Movement and Passenger Volume 2019-2020 [8]

In the tourism market, scholars [9] argue that risk perception is door to judgemental uncertainty. Moreover, the preferences and behaviours of people are intended for their contact with public health emergencies in consideration of perceived risk. The prior work of [10,11] reported consumption behaviour in tourism and found the contribution of perceived risk in comparison to perceived value. Moreover, the pull-push theory of [12] argued that travelling needs and purposes stem from the primary motive of the willingness of people to travel. The work of [13] incorporates quality service as the possible only tool to fill the travelling needs of travellers by adapting to the precausal global health machinery. Moreover, they argue that the quality of service captures consumption trust and the behavioural intention service offers.

Few ongoing studies have highlighted air transportation as a path of virus spread, and countries have adopted policies to stop air service globally [14,15,16]. This gave existence to investigate the realistic path model to manage the aviation industry during the postpandemic period in a tourism-sustained country. In this regard, working executives of aviation machinery are mapping passenger awareness as a feasible path to overcome the existing challenges of commercial aviation and start a distinctive beginning based on physical and psychological safety [4]. This paper is based on three novel points. First, travelling knowledge is a critical consideration for behavioural preference during the pandemic at the destination point other than knowledge of pneumonia [3], usefulness, timing, and facilities. Second, airliners' perception of service quality holds the behavioural key to travel, willingness to use resources, and intention to fly during COVID-19. Third, the theory of knowledge-attitude-behaviour (KAB) is chosen to establish a constructive path between risk knowledge and the behavioural intention of air travel via risk perception.

## Literature Review

COVID-19 is a recent issue of concern for airlines to address and ground policy for the sustainability of air services management. Prior studies have been confined to foreseeing passengers' behavioural changes, risk knowledge, physical and social services capes, satisfaction in connection to sustainable airport image and travel behaviour [1,4,16]. In association with COVID-19, aviation management must take precautions to stimulate and sustain air service as the only option for transportation management under the WHO guidelines. This paper placed service quality and travelling knowledge in a conceptual model to investigate air-travel behaviour under a deductive approach.

## 74 Behavioural Intention

75 The study of [17] embellished the conceptual position of behavioural intention as potential  
 76 future actions of the individuals to forecast human behaviour. [18] considered five dimensions of  
 77 behavioural sustainability, that is, willingness to pay, internal and external response to problems,  
 78 switch and loyalty of travellers. A study on consumption behaviour reported that customer  
 79 retention and buying potential services reflect repurchase intention. Furthermore, customer  
 80 satisfaction consolidates the positivity, feedback and reuse of services in the aviation industry. In the  
 81 context of the service sector, researchers adopted tridimensional measures proposed by [18], that is,  
 82 willingness to pay, intention to reuse airport for investigating behavioural intention [19,20, 21] and  
 83 subsequent hypotheses in the existence of a pandemic. In this research work, KAB theory is chosen  
 84 for the development of a risk knowledge-risk perception-behavioural intention association. The  
 85 KAB model establishes a continuous arrangement of acquiring knowledge, generating beliefs and  
 86 forming behaviour [12]. Other models, such as the theory of planned behaviour (TPB), emphasise  
 87 subjective norms and sustainable behaviour in connection to knowledge, attitudes and behaviour in  
 88 the external knowledge domain of consumer behaviour. The KAB model has vast application in  
 89 prior studies of education, public health, clinical medicine and other social aspects. A partial  
 90 mediation effect of attitude was found by [22], and a direct positive association of knowledge,  
 91 attitude and behaviour was verified along with an indirect association of knowledge in a  
 92 hypertension study by [23].

## 93 Risk Knowledge and Behavioural Intention

94 The research of [12] reported 3-D knowledge domains of general, social and major generated  
 95 from outside interaction, vast-access information and specialised knowledge fields. The individual  
 96 tension preferences connect risk from the knowledge obtained by circling around the civic circle.  
 97 Moreover, he finds that information promotes risk taking behaviour. Complete information  
 98 transforms people to have the tendency to act rationally as exposed to risk and followed risk  
 99 avoidance in connection to incomplete information [25]. Sustainability of knowledge stems  
 100 passengers' intention to rejoin travel, which is restricted post-COVID-19. The distinctive positioning  
 101 of the risk mapped by [26], in terms of financial loss, is directly associated with product  
 102 sustainability. Second, problematic and damaging product or service characteristics ascertain  
 103 psychological consumer perception and dramatize psychological risk. In contrast, consumer  
 104 physical damage is caused by a poor-quality service course for physical risk. Social risk is a probable  
 105 negative comment received in a family setup, work relations, and decision making. Furthermore,  
 106 travel behaviour post-COVID-19 demands sustained efforts of air travel management to synchronize  
 107 service utility as a performance risk along with time consumption in decision making.

108 The empirical findings in the field of medical science connected the spread of risk  
 109 knowledge to lower perception and guide experts' behaviour in the direction of medical care [27].  
 110 Moreover, perceptual risk is the beginning of subjective belief related to the adverse behaviour of  
 111 catching a disease. The cognitive components of individuals possess a stronger association with  
 112 knowledge to have longer work behaviour under public emergencies [28]. Moreover, another study  
 113 exposed opposite findings: poor precautionary practices among individuals were seen under the  
 114 existence of knowledge and attitudes. He further showcases that work practices are always exposed  
 115 to public risk. This is what the profession demands them to do in handling uncertainty and  
 116 sustainable human movement to sustain civic circles.

117 **H1.** Risk knowledge significantly influences the behavioural intention of air travel during the  
 118 pandemic in Thailand.

## 119 Risk Knowledge and Risk Perception

120 A study in the travel domain concluded that the risk of health, terror and natural disasters  
 121 requires knowledge, awareness and experience to have a travelling attitude [29]. Moreover, in the  
 122 context of international tourism, the abundance of risk knowledge grounds a less perceptual  
 123 position on risk and decreases human uncertainty or unfavourable consequences with decisive  
 124 positions [30,31]. The empirical work of [32] revealed that unawareness or zero or minimal risk stem  
 125 from high-risk perception and structure negative consumption decisions.

126 Travel industry documents, crises, and cultural and functional risks are lifting constructs  
 127 of sustainable traveller perception. Similarly, another study argued that social, physiological,  
 128 psychological, time, satisfaction, capital and security risks affect travel perceptions in the service  
 129 sector over a sustained period of time [33,34,35]. Additionally, service risk also needs knowledge to  
 130 tackle uncertainty by designing sustainable tourism policy. The study of [30] in the international  
 131 travel circle found that rich knowledge about travel, food, and health will operationalise and control  
 132 perceived risk. [36] verified the sustained predictive power of risk knowledge for risk perception,  
 133 [37] also studied the negative significance of risk knowledge and public perception along with  
 134 interest involvement and information saturation. Prior work explained that rational choices mitigate  
 135 potential risks by adopting risk sustainability to work in the presence of unfavourable  
 136 circumstances.

137 **H2.** Risk knowledge significantly influences the perceived physical risk of sustainable air travel  
 138 during the pandemic in Thailand.

139 **H3.** Risk knowledge significantly influences the perceived psychological risk of sustainable air  
 140 travel during the pandemic in Thailand.

141 **H4.** Risk knowledge significantly influences the perceived service quality of sustainable air  
 142 travel during the pandemic in Thailand.

## 143 Risk Perception and Behavioural Intention

144 According to [38], perceived risk is the likelihood that unfavourable outcomes would occur.  
 145 People with various personal qualities perceive varying dangers in the same mode of transportation  
 146 [20]. Medical experts believe that individuals with underlying medical problems such as heart  
 147 disease, obesity, asthma, and diabetes may be at an elevated risk of sickness and death from  
 148 COVID-19 [39]. Those who are less able to maintain a sufficient level of health care are unlikely to be  
 149 ready to subject themselves to an enduring danger of incurring more medical expenses. Families  
 150 with children or vulnerable members may be less inclined to risk harming a member of the family  
 151 due to the new coronavirus [40].

152 According to a survey, people's willingness to travel by air will drastically decrease in the near  
 153 future, and the sustainability of travel behaviour could be a point of concern for airliners [41]. As a  
 154 result of the significant decrease in passenger loads post-COVID-19, airlines are engaging directly  
 155 with their customers, most often via email, to reassure passengers about the safety steps they are  
 156 taking, such as rigorous cleaning, disinfecting, and social distancing processes [6].

157 Another study found that evaluating the quality of services offered by businesses determines  
 158 customer trust in that company and sustains consumers' behavioural intention. In an empirical  
 159 study, [18] established 'SERVQUAL,' which assesses service quality along five dimensions:  
 160 tangibles, dependability, responsiveness, assurance, and empathy. This method intended to assess  
 161 customer satisfaction by measuring consumer expectations and perceptions. The study utilised  
 162 SERVQUAL to assess the service quality of airlines from the perspective of foreign passengers.  
 163 Passengers regard comfortable seats and cleanliness to be vital services that any aircraft company  
 164 can provide to have sustainable competitive advantages [42]

165 Furthermore, passengers place a premium on "safety-related services" in the aviation sector.  
 166 Behavioural intents are viewed as a consequence of service quality, influencing customer behaviour  
 167 and, ultimately, the firm's financial situation. The work of [43] demonstrated a direct negative link  
 168 between safety concerns, geographical damage, casualties and damage to facilities and equipment,



169 psychological taboo, ethical problems, financial concerns, and tourist intention. [44] investigated the  
 170 negative effects of social risk, political risk, and cultural risk on Japanese tourist intention. The  
 171 majority of studies have concentrated on the impact of service quality on tourist intention.  
 172 Transportation convenience, tourist safety, lodging convenience, the level of tourism information,  
 173 travel agency services, leisure time, and conforming psychology were all shown to be positively  
 174 linked with tourism intention [45,46]. The connectivity of COVID-19 influences the sustainable  
 175 behaviour of passengers, which is the subject of this study that proposes the following hypotheses:

176 **H5.** Perceived physical risk significantly influences sustainable air-travel behavioural intention  
 177 during the pandemic in Thailand.

178 **H6.** Perceived psychological risk significantly influences sustainable air-travel behavioural  
 179 intention during the pandemic in Thailand.

180 **H7.** Perceived service quality significantly influences sustainable air-travel behavioural  
 181 intention during the pandemic in Thailand.

## 182 **Mediating Effect of Risk Perception on Risk Knowledge-Behavioural** 183 **Intention**

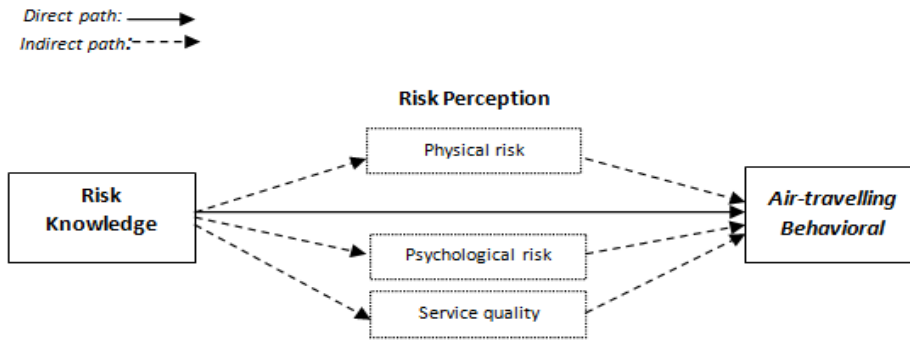
184 One work [47] positioned travelling as a universal human need of modern individuals. The  
 185 Health Belief Model (HBM) reported that the congruence of copious risk perception lifted an  
 186 individual's health-protective sustainable behaviours [48]. Prior studies widely discussed  
 187 health-seeking and health-protective behaviours and prolonged travel decisions in the context of  
 188 health emergencies reported historically, including SARS and Avian flu, [49] and  
 189 nonpharmaceutical intercession for disease [50]. A Korean study on travelling intention during the  
 190 pandemic located citizens' travelling thrust followed in isolation times by capturing the travelling  
 191 knowledge path of curtailing perceived risk [51]. The binary dimensional concept of perceived risk,  
 192 which is cognitive and affective, also affirms susceptibility, severity and anxiety of an individual's  
 193 exposure to risk [52]. Moreover, there is strong evidence that service quality has either a direct effect  
 194 on the behavioural intentions of customer sustainability and/or an indirect effect on such intentions,  
 195 mediated through customer satisfaction [18,]. A survey of 457 medical students concluded that  
 196 health safety, such as the transmission of hepatitis C, is open to individuals who ask for the shed of  
 197 knowledge to control the perceptual positioning of HCV and capture behavioural intention towards  
 198 medical care [27]. In the marketing domain, the study of [53] mentions that an abundance of  
 199 knowledge structure led to a decline in risk perception and arousal of sustainable motives towards  
 200 purchasing intention. Moreover, behavioural intention is directly associated with knowledge value  
 201 control of product uncertainty [54]. The empirical work of [55] in the Chinese service sector studied  
 202 the factor of information disclosure intention and concluded perceived risk as a contributor to  
 203 behavioural intention by means of transparent information processing.

204 **H8.** Perceived physical risk significantly mediates risk knowledge and the behavioural  
 205 intention of sustainable air travel during the pandemic in Thailand.

206 **H9.** Perceived psychological risk significantly mediates risk knowledge and the behavioural  
 207 intention of sustainable air travel during the pandemic in Thailand.

208 **H10.** Perceived service quality significantly mediates risk knowledge and the behavioural  
 209 intention of sustainable air travel during the pandemic in Thailand.

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[Figure 2 Conceptual Model of the Study]

## 214 Methods

### 215 Population and Sampling

216 The top six Thai airports with the majority of passengers in the first quarter of 2021,  
217 Bangkok Don Mueang, Bangkok Suvarnabhumi, Chiang Mai, Phuket, Hat Yai and Nakhon Si  
218 Thammarat, are taken as the population (N=5.05 million) of the study (see table 1). Multistage  
219 sampling is used, starting with Yamane's (1986) formula, and a sample (n=399) is drawn from the  
220 population.

221 Yamane formula =  $N/1+N(e)^2$

222 Total population: N=5,050,000

223 Error: e=0.05

224 Sample: n=399

225 Then, the stratified sampling formula is used to obtain a proportionate sample from each of the  
226 study strata. Sample of each strata:  $n_s = \text{targeted population} \times \text{sampling population} / \text{total population}$ .  
227 Participant willingness and privacy are assured along with data separation to handle the common  
228 method bias proposed in [56].

229 **Table. 1 Statistics of air service users in the first quarter of 2021.**

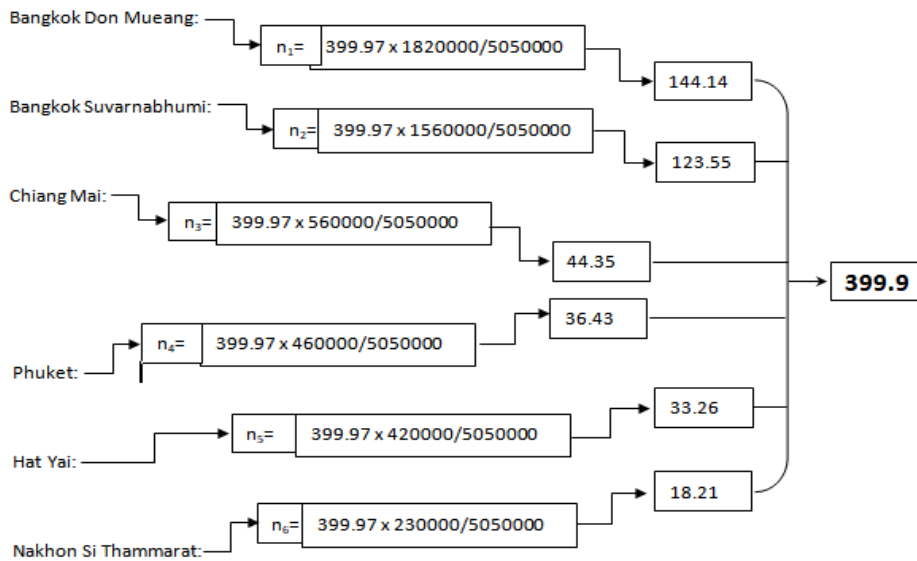
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S. No	Thailand Airports	Number of passengers	% Decrease in passengers
1	Bangkok Don Mueang	1.82	-76.2%
2	Bangkok Suvarnabhumi	1.56	-87.0%
3	Chiang Mai	0.56	-74.1%
4	Phuket	0.46	-88.0%
5	Hat Yai	0.42	-46.5%
6	Nakhon Si Thammarat	0.24	-25.8%
7	Chiang Rai	0.23	-61.7%
8	Udon Thani	0.22	-59.2%
9	Ubon Ratchathani	0.19	-50.6%
10	Khon Kaen	0.18	-55.0%
11	Surat Thani	0.16	-63.0%
12	Krabi	0.14	-82.9%
13	Trang	0.08	-49.6%

14	Ko Samui	0.07	-86.7%
15	Phitsanulok	0.06	-57.2%

230 *Sources: Airports of Thailand Public Company Limited, Department of Airports, U-Tapao Airport Authority*  
 231 *and Bangkok Airways Public Company Limited: Analysis by the Aviation Economy Division*

232 The statistics of passengers at the top 15 airports in Thailand indicate a substantial decline in the  
 233 first quarter of 2021 in comparison to the previous year. Bangkok Don Mueang airport had 1.82  
 234 million travellers, a 76.2% decrease, Bangkok Suvarnabhumi had 1.56 million travellers, an 87.0%  
 235 decrease, Chiang Mai had 0.56 million, a 74.1% decrease, Phuket had 0.46 million, an 88.0% decrease  
 236 and the fifth airport Chiang Rai had 0.23 million, a 61.7% decrease. The statistics for these six airports  
 237 are shown in Table 1.  
 238



239 **Figure 3** Sample Estimation

## 241 Instrument

242 This paper emphasised an adapted instrument for the measurement of five variables using a  
 243 five-point Likert scale. The variable risk knowledge is measured using a 10-item scale of [12,57,58],  
 244 the constructs; 3-items of physical and 4-items of psychological risk from [59] and 4-items of service  
 245 quality at airports [60,50] represents risk perception. Moreover, a 13-item scale was used to measure  
 246 the behavioural intention of [61,57, 62] air travel in consideration of the Thai aviation industry.  
 247 Following the variable part, the questionnaire contained age, gender, education and travelling  
 248 frequency to display the demographical profile.  
 249  
 250

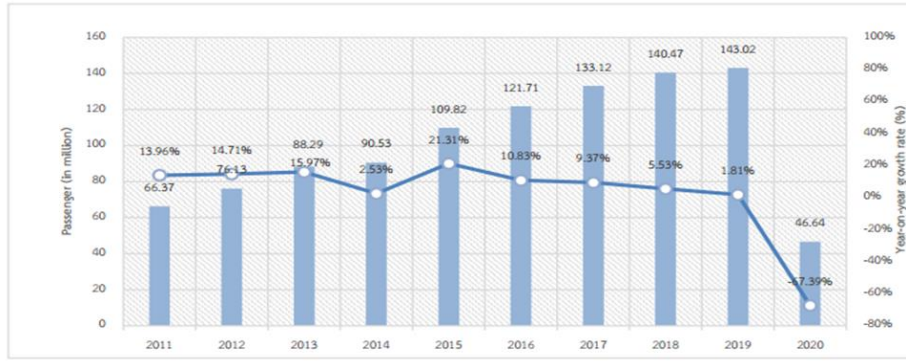


Figure 3 Passengers (in millions) and % Change 2011-2020.

The graph displays the story of air services in Thailand over a period of 10 years. In 2011, 66.37 million people used air services in Thailand (13.96), and there was an increase in the number of passengers. However, in 2019-2020, passengers decreased from 143.02 to 46.46 million, and the decline rate was 1.81 to -67.38 due to COVID-19 [11].

## Data Collection and Data Analysis

Data collection was performed over a period of six months starting in January 2021 and covering the first quarter. An online survey using Google Form is being adopted by the researcher as a realistic tool to approach passengers in the presence of COVID-19 at their compulsory agreement option to be part of this study under research ethics. The simultaneous connectivity of the constructs is a central point of SEM multivariate analysis that is being performed in this study using partial least squares (PLS-3). Variance-based SEM is not contingent upon the normality of the distribution and theory testing edge in a single complex model [63]. The bootstrapping resampling technique is part of the analysis for the significance of sample estimate driving t values [64].

## Findings

### Demographics of the Passengers

Table 2, which provides a demographic representation of participants, indicates 163 males (40.9%) and 236 females (59.1%) ; 67 individuals aged 21-30 years (19.0%), 31-40 years (37.6%), 41-50 years (24.8%), 74 of them above 50 years (18.5%) ; 34 individuals with higher secondary (8.5%), 216 with a Bachelors (54.1%) and 149 with a Masters (37.3%) . On the same side, the participant’s travel frequency was also categorised as 133 once a year (33.3%), 73 twice a year (18.3%) and 193 more than twice a year (48.4%).

Table 2 Demographic Categorisation

Item	Options	Sample
Gender	Male	163(40.9%)
	Female	236 (59.1%)
Age	21-30 years	76(19.0%)
	31-40 years	150(37.6%)
	41-50 years	99(24.8%)

		Above 50 years	74(18.5%)
		Higher secondary	34(8.5%)
	Education	Bachelors	216(54.1%)
		Masters	149(37.3%)
		Once a year	133(33.3%)
	Travel frequency	Twice a year	73(18.3%)
		More than twice a year	193(48.4%)

276

## 277 Measurement Model

278 Constituting the two-step analysis, first, the measurement model analysed construct validity  
 279 and reliability. Convergent validity indicates the ability of an item to measure the corresponding  
 280 construct. Here, the average variance extracted (AVE) scores for the independent variable RK=0.56,  
 281 mediating variables PSY=0.79, PR=0.67, SQ=0.64 and finally the dependent variable BI=0.71 are well  
 282 above the cut-off value of 0.5 [65]. In CFA, BI8, BI12 and BI13 are deleted for behavioural intention;  
 283 PRS1 is deleted for psychological risk in consideration of the low factor loading, i.e., <0.4, as  
 284 proposed by [66].

285 Second, reliability, which measures the consistency of items, is tested using Cronbach's alpha  
 286 and CR for RK=0.90 and 0.92, PSY=0.87 and 0.92, PR=0.75 and 0.86, SQ=0.81 and 0.87, and BI=0.95  
 287 and 0.96, respectively, and ranges from 0.7 to 0.9 as good and excellent, as proposed by [63] (Chin et  
 288 al., 2006) (see Table 3).

289 Moreover, the items' differentiation of the construct was tested using the discriminant validity  
 290 measure of the heterotrait-monotrait ratio (HTMT) in variance-based SEM (see table). [67] reported  
 291 an HTMT value less than 0.9, and [68] reported a value less than 0.85 to assess discriminant validity.  
 292 The scores of HTMT comparisons for the study variables RK, PR, PSR, SQ and BI were below the  
 293 cut-off scores (see Table 4).

294 **Table 3. Construct Validity and Reliability**

Construct	Item Code	Loadings	Cronbach's alpha	AVEs	CR
Risk Knowledge (RK)	RK1	.429	0.907	0.56	0.925
	RK2	.716			
	RK3	.784			
	RK4	.788			
	RK5	.837			
	RK6	.858			
	RK7	.764			
	RK8	.576			
	RK9	.793			
	RK10	.831			
Psychological risk perception (PSR)	PSR2	.843	0.874	0.799	0.922
	PSR3	.914			
	PSR4	.922			
Physical Risk Perception (PR)	PR1	.762	0.757	0.675	0.861
	PR2	.841			

		PR3	.858			
1						
2	Service Quality	SQ1	.691	0.816	0.645	0.878
3	(SQ)	SQ2	.798			
4		SQ3	.876			
5		SQ4	.836			
6						
7	Behavioural Intention	BI1	.849	0.954	0.711	0.961
8	(BI)	BI2	.892			
9		BI3	.657			
10		BI4	.881			
11		BI5	.842			
12		BI6	.875			
13		BI7	.889			
14		BI9	.838			
15		BI10	.842			
16		BI11	.841			
17						
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295 *Note: Composite Reliability: CR; Average Variance Extracted: AVE*

296

297 **Table 4 HTMT**

	BI	PR	PSR	RK
BI				
PR	0.571			
PSR	0.478	0.835		
RK	0.318	0.605	0.446	
SQ	0.085	0.191	0.086	0.555

298

## 299 Structural model

300 **Table 5 Direct Effect**

Path	Coefficient	Standard		t value	p values	Remarks
		Deviation				
PR -> BI	-0.323	0.067		4.848	0.000	Supported
PSR -> BI	-0.158	0.062		2.54	0.011	Supported
RK -> BI	0.181	0.076		2.372	0.018	Supported
RK -> PR	0.506	0.053		9.536	0.000	Supported
RK -> PSR	0.407	0.048		8.515	0.000	Supported
RK -> SQ	0.493	0.053		9.309	0.000	Supported

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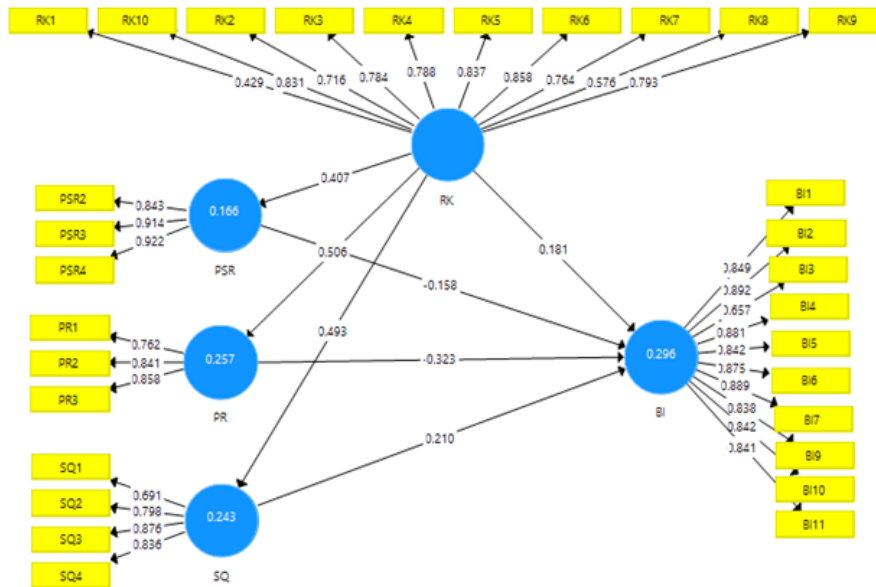
SQ -> BI	0.21	0.043	4.868	0.000	Supported
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301 *Note: PR: Physical Risk; PSR: Psychological Risk; RK: Risk Knowledge; SQ: Service Quality Risk; BI:*  
 302 *Behavioural Intention.*

303 **Table 6 Indirect Effect**

Paths	Coefficients	Standard Deviation	t value	p values	Remarks
RK -> PR -> BI	-0.164	0.041	3.957	0.000	Supported
RK -> PSR -> BI	-0.064	0.028	2.269	0.024	Supported
RK -> SQ -> BI	0.103	0.024	4.257	0.000	Supported

304  
 305  
 306 Table 6 indicates the significance of the indirect effect of RK via PR ( $\beta=-0.164$ ,  $p<0.000$ ), PSR ( $\beta=-0.06$ ,  $p<0.000$ ) and SQ ( $\beta=0.10$ ,  $p<0.000$ ) on BI. Here, both conditions of the mediation model are  
 307 verified [69,70]. The empirical evidence comes with the evidence of the mediating role of the risk  
 308 perception by having the facets of physical risk, psychological risk and service quality to reach  
 309 behavioural intention of travellers in the Thai aviation industry, thus supporting H8-H9-H10.  
 310  
 311



312  
 313  
 314 **Figure 4 Structural Model**

## 315 Discussion and Conclusion

### 316 Discussion

317 This study aimed to understand sustainable air travel behavioural intentions in the context of  
 318 the Thai aviation industry to determine how pandemics alter behavioural makeup. First, the  
 319 empirical results mapped a significant positive association of risk knowledge and behavioural  
 320 intention to sustainable travelling decisions. This explains the contributing power of knowledge in  
 321  
 322

321 unfavourable situations such as COVID-19, where life threats are present but knowledge excels as an  
 322 optimistic way to work or visit areas away from home via physical journey [3,27]. Second, this work  
 323 elucidates the significant contribution of risk knowledge to risk perception, with a more specific  
 324 positive significant impact on physical, psychological and service quality attributes to overcome the  
 325 fear and arousal of integrative capacity in humans under challenging circumstances, which was also  
 326 highlighted by [36]. Third, the path coefficients indicate behavioural intention under a significant  
 327 negative impact of psychological and physical risk perception in connection with [42,28], while a  
 328 positive significant effect of service quality is supported by [71]. This means that the less damaging  
 329 perception under pandemic along with more quality aviation service sustains travellers to move  
 330 towards their destination, supporting the claim of [16]. Finally, empirical evidence showcases the  
 331 reasoning that the perception of risk obtains the feasibility of travel willingness. This is the path that  
 332 is being highlighted by the work of [23], explaining the connectivity of knowledge to perceptual  
 333 buildup contributing behavioural development. Here, many human intentions and work standards  
 334 of the aviation industry in Thai circles play a connecting role to the chain safety of people to sustain  
 335 travelling habits during pandemics. Ranking the mediating effect of the variables, physical risk had  
 336 the highest significantly negative effect, followed by service quality with a positive significant effect  
 337 and psychological risk with a minor negatively significant effect on the relationship of knowledge  
 338 risk and travellers' behavioural intention.

## 339 Conclusion

340 This research work is based on a deductive approach to an intact theoretical model with  
 341 empirical evidence to examine the connectivity of risk knowledge reasoning and perception of risk  
 342 and then the behavioural intention of travellers in Thailand. A survey is conducted by incorporating  
 343 399 respondents who travel through renowned airports using a variance-based SEM technique to  
 344 generate empirical evidence to test the hypothesised relationship. The statistical analysis of this  
 345 work suggests the predictive power of risk knowledge in sustainable behaviour to fly using aviation  
 346 services. Second, the findings reveal a significant contribution of risk perception constructs, i.e.,  
 347 psychological, physical and quality of service, to intention development during travel inside and  
 348 outside of Thailand. Finally, the empirical evidence promulgates the mediating connectivity of risk  
 349 knowledge and behavioural intention via risk perception. Overall, the study explains that  
 350 pneumonia and travelling knowledge are critical tools that will sustain cognitive makeup to  
 351 understand the existence of pandemics but continue the life circle with perceptual balance, leading  
 352 the willing power to travel under a controlled work environment.

## 353 Implications and Limitations

354 The recent era of isolation modified the positions of human safety and business survival. The  
 355 current pandemic has shifted the entire human conduct of social connectivity, business demeanour,  
 356 travelling and many more. In the literature, a variety of studies spotlight the prevalence of  
 357 pandemics along with causes and consequences in the field of academic and business research.  
 358 Perceptual studies are limited in number to open the range of such disasters in the recent past. Prior  
 359 studies analysed the economic, civic, health and educational bump of pandemics across the globe.  
 360 Considering the pandemic crisis perception, an impact mechanism of crisis knowledge on travellers'  
 361 behavioural intention via perception of risk was composed.

362 The academic side of the study had multiple implications as a body of knowledge. First, this  
 363 study contributes to the field of service management by designing an impact mechanism of risk  
 364 knowledge guiding service consumption behaviour. Second, the study accumulated travelling and  
 365 pneumonia knowledge leading behavioural intention, and previous pneumonia and tourism  
 366 knowledge during COVID-19 is being investigated in the Chinese context. Third, the mediating  
 367 factors are given consideration in this empirical work to highlight the reasoning path from risk  
 368 knowledge to travelling behaviour via physical risk, psychological risk and service quality. The  
 369 empirical findings open the gate by demonstrating the conceptual means of constructing knowledge  
 370 under uncertain circumstances across the country. Finally, this research elaborates the underpinning



371 behavioural components of intention, willingness and recommendations for going across the  
 372 country in the extensive confrontation of COVID-19.

373 The empirical findings of the study promulgated the personification of risk knowledge on  
 374 behavioural makeup in the Thai aviation industry. The management of the aviation industry adds  
 375 information to sustain travelling and pandemic knowledge. This information channel will  
 376 disseminate preventive measures of epidemics during travel. The perceptual development of  
 377 travellers can be captured by mapping the lack of knowledge in the aviation industry by cultivating  
 378 knowledge about uncertainty. This study provides critical insight for the aviation industry to  
 379 redesign operation manuals in consideration of external factors, and adaptive measures are required  
 380 to spread the pandemic. A perceptual shift is what the Thai aviation industry needs to achieve for  
 381 sustainable local and international tourism, which would be possible by channelling knowledge of  
 382 viral disease, travelling, physical and psychological uncertainty asking for service quality shift and  
 383 leading traveller behaviour.

384 This paper makes a significant contribution to the sustainable travel behaviour of passengers  
 385 during prolonged uncertain travelling situations during COVID-19. There are certain limitations  
 386 that limit the study findings to six airports. Second, the limited sample of the paper can be extended  
 387 to have broader generalising power to the population. Third, the cross-sectional data of this paper  
 388 can be shifted to longitudinal data for in-depth work. Next, in the broader spectrum, organisational  
 389 culture typologies are crucial beliefs that can be included in moderation capacity in the study model  
 390 to widen future implications.

391 **Author Contributions:** W. N and K. Q conceptualised the idea of the study design and wrote the  
 392 original draft and methodology. K. Q and M. T performed the review, editing, formal data analysis,  
 393 and validation. Undertook the survey and worked on data, review and editing. All authors have  
 394 read and agreed to the published version of the manuscript.

395 **Funding:** “No funding”.

396 **Acknowledgements:** [All the authors have Warangsiri Niemtun, Kaida Qin and](#)  
 397 [Muhammad Toseef](#) contributed equally to this study. The authors would like to thank all the  
 398 participants of the study and funding agency for completion of this research work.

399 **Conflicts of Interest:** Declare conflicts of interest or state “The authors declare no conflict of interest.”

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**Reviewer Recommendation and Comments for Manuscript Number HELIYON-D-22-01252****A Study on Sustainable Air-Travel Behaviour under the Possible Remedy of Risk Knowledge: A Mediating Perspective of Risk Perception during COVID-19**

Original Submission  
Samuel PD Anantadajaya, Dr

[Back](#)[Edit Review](#)[Print](#)[Submit Review to Editorial Office](#)**Recommendation:** Invite Revision**Overall Manuscript Rating (1 - 100):** 50**Custom Review Question(s):**

Methods: Are the methods described in sufficient detail to understand the approach used and are appropriate statistical tests applied?

Results: Are the results or data that support any conclusions shown directly or otherwise publicly available according to the standards of the field?

Interpretation: Are the conclusions a reasonable extension of the results?

Ethics: Does the study's design, data presentation, and citations comply with standard COPE ethical guidelines and has proper approval and consent been acquired as outlined in our [Editorial Policies](#)?

I acknowledge that I will provide requirements for improvement, where possible, for the paper to meet all the above four criteria in my comments to the author, below.

Please indicate whether the paper contains one of the following:

**Response**

Yes

Yes

Yes

Yes

OK

Incremental advances

Preliminary findings

Negative results

**Reviewer Comments to Author****Methods:**

1. appeared to be OK using the multi-stage sampling processes. However, the stratified is based on "what" strata? Was it based on the size of airports, or the total numbers of passengers arriving into airports? The table 1 appeared to show the "total numbers of arriving passengers but nowhere is actually stated about the stratified stage of the sampling process. The proportion part of the sampling process was explicitly noted, however.

2. an additional validity and reliability may have to be added to show the overall level of validity and reliability given the available variables & sub-variables

**Results:**

1. the results were just too small to read

2. if the "risk knowledge" was assumed to be the mediator, why did the arrows going out of RK rather than going inside RK from PSR, PR and SQ?

**Interpretation:**

1. I am actually confused with the "mediator", but the arrows in PLS were going out of RK. The pertinent interpretations may be leading into other meanings though

2. Due to the different directions of arrows, the results, interpretations and managerial implications were substantially different

3. should be added lots more of the managerial implications, not only for the passengers' quality, but also for the airliners/airports

**Other comments:**

1. the format for the citations should have been based on APA or IEEE?

2. all citations and bibliography should be made automatic by Mendeley or other third-party programs

3. old references should be accompanied by newer ones, at least, as the situations and conditions have changed drastically due to inflations or levels of risks, particularly with the presence of covid. Old references were not having any experience of covid. Therefore, any old sources addressing perception of risk, risk handling, willingness to pay, willingness to accept and behavioral intentions were drastically different then in 1970s, 1980s and 1990s.

**Reviewer Confidential Comments to Editor:**

may have to perform a major overhaul on this manuscript as it is claimed to have "mediator", but the arrows are pointing to different directions. In my opinion, the arrows should have been pointing to the opposite directions from PSR to RK, from PR to RK, from SQ to RK. Then, from RK to BI. Direct arrows from PSR to BI, and PR to BI, and SQ to BI are still possible to learn the likelihood of influences.

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S A M &lt;ethan.eryn@gmail.com&gt;

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## Thank you for reviewing for Heliyon

1 message

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**Heliyon** <em@editorialmanager.com>  
Reply-To: Heliyon <info@heliyon.com>  
To: Samuel PD Anantadjaya <ethan.eryn@gmail.com>

Thu, Feb 3, 2022 at 1:04 PM

Manuscript Number: HELIYON-D-22-01252

A Study on Sustainable Air-Travel Behaviour under the Possible Remedy of Risk Knowledge: A Mediating Perspective of Risk Perception during COVID-19

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Kind regards,

Martin Thomas Falk, PhD  
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