

To board or not to board? Understanding the drivers of intention to fly during the COVID-19 crisis

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To board or not to board? Understanding the drivers of intention to fly during the COVID-19 crisis

This study sheds light on consumer demand for air travel in the pandemic context by proposing and evaluating a model that combines the personal and third-party beliefs on travel intentions (Theory of Planned Behaviour), as well as the perceived level of threat and familiarity (Protection Motivation Theory). The model is evaluated with a sample of 381 respondents from Portugal, into two groups: travellers vs. non-travellers. Our results provide evidence that for both groups, self-efficacy and social influence are positively associated with the intention to fly. On the other hand, for non-travellers, attitudinal preferences are negatively driven by response cost and level of fear. For the COVID travellers, familiarity positively affects attitude toward flying. This study contributes to a shift in the paradigm of tourism and can be used by airline companies and tourism operators, deepening the understanding of customer motivation for air travelling during the pandemic.

Keywords: Air travel; Protection Motivation Theory; Theory of Planned Behaviour; Tourism.

1. Introduction

World tourism has been greatly affected by the COVID-19 pandemic crisis, changing from over-tourism to non-tourism (Gössling *et al.*, 2021). With a decline of 79% in international arrivals, and a loss of USD 1.3 trillion in export revenues, tourism had in 2020 its worst year in world's history (UNWTO, 2021). Air travel restrictions imposed by national governments caused travel demand to collapse, such that by February 2020 over 80 countries had closed borders (Think Global Health, 2020), immediately making many destinations unavailable to international or national flights. Portugal, one of the last countries in Europe to register a confirmed case, declared a state of emergency late in March 2020 and imposed a lockdown. As a result of the pandemic crisis, the number of national and international arrivals in Portugal fell 39.2% and 75.7%, respectively (Turismo de Portugal, 2021).

The air travel industry is well known for its strict rules, restrictions, and policies that guarantee reliability, safety, and security from the airport of origin to the airport of destination (Frederickson and LaPorte, 2002). The security checkpoints at the airports (Pütz, 2012) and the limited space inside the aircraft may create the perception of high risk for COVID-19 transmission due to the proximity among passengers and interaction with airport staff and aircraft crew. The pandemic situation justified the creation of new policies and practices to mitigate the risk of COVID-19 transmission inside the airports and airplanes, including for instance changing boarding methods to preserve social distancing (Milne *et al.*, 2021), pre-flight temperature check, COVID-19 testing, and mandatory use of masks (Khatib *et al.*, 2020). Indeed, the risk of COVID-19 transmission during air travel and the safety policies created to prevent may influence the consumer's intention to take a flight (Sánchez-Cañizares *et al.*, 2021).

Furthermore, air traveling decisions often rely on perceived personal and physical safety, which are strongly influenced by information and news on traditional and social media (Kozak *et al.*, 2007). Recent studies have warned about the significant amount of misinformation on social media that can influence consumer decisions and even aggravate the epidemic (Cinelli *et al.*, 2020; Kim *et al.*, 2019). The information on media has triggered a wave of fear and anxiety amongst air travellers (Lamb *et al.*, 2020), who may no longer see airplanes as a safe mean of transportation.

Thus, understanding the impact of consumers' fear and/or anxiety during the pandemic crisis the effects of social influence on traveller's attitude and intention to fly is critical in order to mitigate the negative effects on the air travel industry. However, these factors remain barely explored in the literature (Lamb *et al.*, 2020; Parady *et al.*, 2020; Zheng *et al.*, 2021). To analyse the factors mentioned above during COVID-19 times, we draw on the Protection Motivation Theory (Rogers, 1975) and the Theory of Planned Behaviour (Ajzen, 1991). In addition, although air travel restrictions and safety measures have been imposed at a global scale (e.g., lockdowns and travel restrictions in Europe), a respectable number of people have already travelled since then. Therefore, this study investigates how the drivers of intention to fly may differ among people who had already travelled and those who had not.

One of the limitations of recent studies on travel intentions during the COVID-19 pandemic is the adoption of a generic approach that includes various means of transportation and destinations (Chua *et al.*, 2021; Das and Aviral, 2021; Neuburger and Egger, 2021; Rastegar *et al.*, 2021; Sánchez-Cañizares *et al.*, 2021), thereby neglecting the specific factors of air travel that may influence the decision to fly.

Our study makes four contributions to the body of knowledge on tourism and air travel decisions. First, we establish a bridge between two well-known theories, the

Theory of Planned Behaviour and Protection Motivation Theory; we refer to the merge of those two theories as the Planned-Protection-Motivation (PPM) approach. In the context of tourism, although recent studies explored the PMT theory (e.g., Rather, 2021b; Seow *et al.*, 2021; Wang *et al.*, 2019), these studies did not analyse the joint effects of TPB and PMT. Thus, in the context of air travel, this research is the first to integrate both theories using the Planned-Protection-Motivation (PPM) approach. Our contribution lies on being the first research (to the best of the authors' knowledge) to integrate TPB & TMP theories in the context of air travel. By doing so, this study combines theoretical constructs of personal and third-party beliefs regarding the pandemic crisis and the perceived level of fear to shed light on the intention to fly during COVID-19 times. Second, the data collection took place several months before the country's mass-vaccination plan began, which implies that the fear and anxiety of travellers could be greater than after the vaccinations began, making this scenario a unique opportunity for data collection. Third, this study performs a multi-group analysis about intention to fly between travellers and not-yet-travellers during the pandemic crisis, identifying key differences in air travel decisions between them. Fourth, we shed light on the moderating effect of social influence between fear and attitudes. Moreover, this study also provides several practical implications that can be applied by airline companies and tourism operators to improve consumers' safety perceptions about air travel.

2. Literature review

2.1. Theoretical framework

The intention to fly during the pandemic crisis may not be as linear to determine as before. Every country has a different situation regarding confirmed cases, travel

restrictions, and lockdown. For this reason, air travellers may consider new factors that were not affecting their decisions previously. The study of travel intentions should be based on both self and third-party beliefs, considering the perception of safety or threat that travelling may pose. We propose a barely explored theoretical approach by joining the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the Protection Motivation Theory (PMT) (Rogers, 1975, 1985). We call this new approach the Planned Protection Motivation (PPM) model on intention to fly.

The Theory of Planned Behaviour (Ajzen, 1991) is one of the most recognized theories employed for evaluating the drivers of the intention to adopt a certain behaviour, or its continuance. It was designed as an improvement of the Theory of Reasoned Action (Ajzen and Fishbein, 1980), which does not consider individual judgments on their competence to cope with the recommended behaviour, as well as the perception that they have toward it. Based on individual behaviour, it comprises three main drivers: (i) attitudinal preferences, (ii) subjective norm, and (iii) perceived behavioural control.

The Protection Motivation Theory (Rogers, 1975, 1985), was developed to help clarify fear appeals, by predicting protective behaviours based on what people fear. This theory aims to predict one's intention in protective actions (Anderson and Agarwal, 2010). In the current situation, the pandemic has brought fear and anxiety to consumers, and this constraint may affect their intention to fly. Therefore, PMT is used in this study to analyse the impact of the pandemic on consumers' choices and appraisals. PMT has two main components: (i) Coping Appraisal; and (ii) Threat Appraisal.

Only a few recent studies have been undertaken using the integration of the two theories (TPB and PMT) in the context of tourism. For instance, (Rather, 2021a) examined the tourist's revisiting behaviour and found that the fear and risk related to

COVID-19 negatively impacts the tourist's attitude and intention to revisit, while the influence of tourism-based social media showed a positive effect on the consumer brand engagement. (Yasami, 2020) extended the PMT by adding the subjective norms construct from TPB to shed light on the factors that drive the customer's choice of restaurants based on hygiene cues. Finally, (Seow *et al.*, 2021) tested TPB and PMT in the context of medical tourism and found that attitude and subjective norm were the strongest predictors of medical tourism intention.

The proposed PPM evaluates the intention to fly by joining the two theories described above in adaptation to the air travel scenario. From the TPB, the proposed approach draws on the attitudinal preferences and social influence regarding air travel during the pandemic. From the PMT, we highlight the perceived threat that flying during the pandemic may bring, as well as how familiar consumers may be with COVID-19 preventive measures. The Planned Protection Motivation model is illustrated in Figure 1.

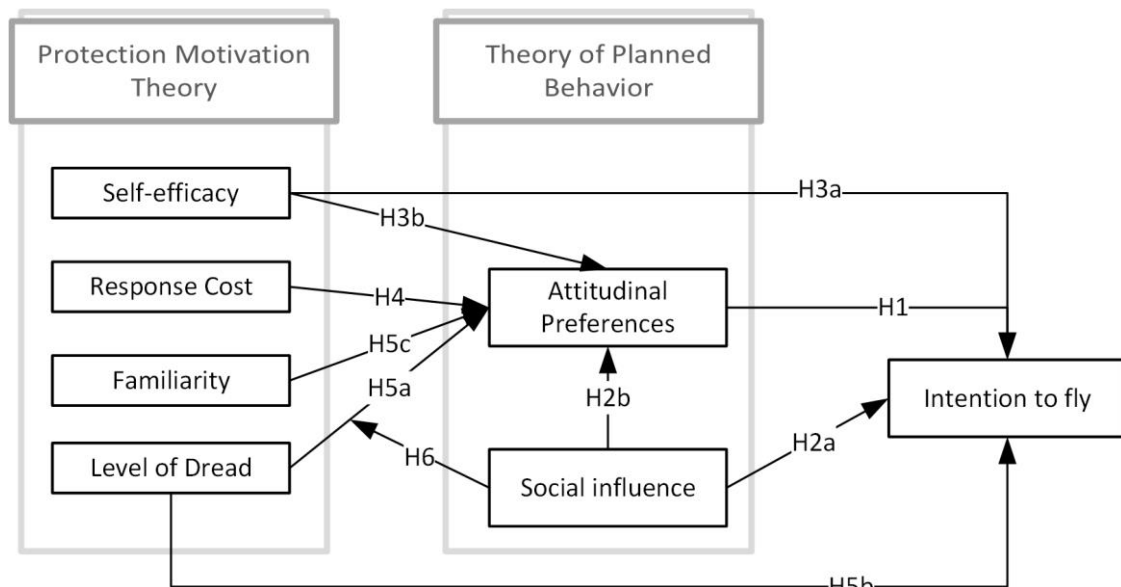


Figure 1. Research model

2.2. Hypothesis development

2.2.1. Attitudinal preferences

Attitudinal preferences reflect the individual perception of one's behaviour by evaluating its favourability. The more positive is the consumer's preference, the more likely s/he is to increase the intention (Ajzen, 1991). Recent literature on travel intentions has examined attitudinal preferences with risk uncertainty, air travel, experience, and travelling during COVID-19 (Li *et al.*, 2020; Morten *et al.*, 2018; Nimri *et al.*, 2020; Quintal *et al.*, 2010).

Given the current high standards of travel, if a consumer perceives travelling as positive, their travel intentions will increase. For instance, Levitt *et al.*, (2019) found that attitudes might improve travel planning behaviour. Also, Gardiner *et al.*, (2013) suggest that attitudes can influence travel decision making. Finally, and directly linked to our research context, Morosan, (2012) found that travellers' attitudes influence air travel security. Therefore, given the current travel context (e.g., COVID-19 pandemic), we predict that attitudinal preferences might improve travel intentions. Thus, based on TPB and recent research on air travel behaviour, the following hypothesis is proposed:

H1: Attitudinal preferences affect positively the intention to fly.

2.2.2. Social Influence

In a digitalized world, where Internet connection is generally available, different opinions can be read on social media, news channels, and blogs. Social influence evaluates how the opinion of others influences individual perception and intention, whether that opinion comes from friends, family, or the Internet. If social influence has a favourable opinion regarding travel, one's opinion will tend to be favourable, as well as one's travel intentions. Recent research done in the Philippines has shown that social

influence on COVID-19 has had a positive correlation with the intention to adopt preventive measures (Prasetyo *et al.*, 2020). Moreover, in Portugal COVID-19 has triggered different opinions on Portuguese health professionals (Peres *et al.*, 2020). This study therefore seeks to determine whether those public opinions are relevant to the intention to fly.

Drawing on recent research (Confente and Vigolo, 2018), we propose that social influence positively affects intention to fly (H2a) and attitudinal preferences regarding flying (H2b). Recently, Confente and Vigolo, (2018) found the key role of social influence on travel attitudes and behaviour. These two variables are important variables in our model, since we examine social influence effects on intention to fly and its related attitudes. Tanford and Montgomery, (2015) also pointed out the key role of social influence on travel purchase decisions. The authors found that social influence is a key factor predicting travel behaviour. Interestingly, and akin to our theoretical rationale, Wang (2012) found that social influence was relevant to predict and determine intention to travel, even when social influence occurred only online. The following hypotheses are made:

H2a: Social influence positively affects the intention to fly.

H2b: Social influence positively affects attitudinal preferences regarding flying.

2.2.3. *Coping Appraisal*

Coping appraisal evaluates how an individual assesses their capability and competence to deal with an existing threat (Rogers, 1975, 1985; Yasami, 2020). To understand travel intentions, it is crucial to retrieve consumers' thoughts on how they deal with the pandemic, and what they believe to be beneficial to control it and to prevent transmission. In this study, coping appraisal focuses on the traveller's perception about the preventive measures implemented against COVID-19 in airports and airplanes, for

example wearing masks during the flight or measuring temperature at the airport entrance.

The coping appraisal construct includes the individual's perception of their effectiveness to perform a recommended behaviour, the so-called self-efficacy. According to (Ajzen, 1991), perceived behavioural control from TPB and self-efficacy from PMT are equivalent. Therefore, the proposed model merges these concepts into a single variable (self-efficacy). If travellers believe that they can implement preventive measures against COVID-19, and its efficacy depends on them, they will feel safer, and their attitude toward travel is likely to improve. Consequently, the intention to fly will also increase. Based on TPB and PMT, the following hypotheses are suggested:

H3a: Self-efficacy affects positively the intention to fly.

H3b: Self-efficacy affects positively attitudinal preferences.

Coping appraisal also includes response efficacy, which refers to the perception of the traveller that the recommended behaviour will be effective against a threat (Rogers, 1985; Ruan *et al.*, 2020). However, since measures to prevent COVID-19 during a flight are not recommendations, but policies of mandatory compliance for all passengers from the moment they enter the airport regardless of their perception of efficacy, we do not include response efficacy in our model.

Finally, coping appraisal takes into consideration the effort made by the travellers and the costs in terms of money and time needed to implement the behaviour – response cost (Rogers, 1985). Response cost includes consumers' discomfort and negative appraisal when taking preventive measures against COVID-19. These costs may include discomfort when using masks, waiting longer than usual in a queue, proximity of personnel who measure the body temperature, or hand sensitivity to using disinfection products. Therefore, the goal is to assess if the response cost implies a

decrease in the perceived attitudinal preferences toward traveling. Accordingly, the following hypothesis was developed:

H4: Response cost affects negatively attitudinal preferences.

2.2.4. *Threat Appraisal*

Threat appraisal involves the perceived level of threat a certain behaviour brings and how it affects intention (Rogers, 1985; Yasami, 2020). Threat Appraisal is composed of Perceived Vulnerability, which is the probability that one will experience harm from the behaviour, and Perceived Severity, which is the degree of danger that the behaviour will entail. Research on risk perception has demonstrated that there is a gap between the actual risk and the individual's perception of the risk (Slovic, 1987). For that reason, Slovic developed three key factors that help to understand the perception of risk: (i) Level of Dread; (ii) Familiarity; and (iii) Number of People Involved. Dread and familiarity are included in the threat appraisal. The number of people involved will not be considered as variable in our model because the traveller has no information about the number of people in the airport or sharing the airplane.

Since the beginning of the pandemic, some travellers' decisions have been affected by fear, such as panic (Arafat *et al.*, 2020). According to the PMT, fear is often very effective in behavioural changes. Fear from COVID-19 is real and has affected a large percentage of people, and, in some cases, has led to depression (Tsang *et al.*, 2021). The way people decide to travel during a pandemic may not be the same as before the pandemic due to the level of fear that is now present. The greater the perceived fear, the less someone is willing to travel (Duan *et al.*, 2021). Although fear may relate to intention to fly, individual attitudes must change for that to happen. Therefore, this study aims to understand if fear also affects the attitudinal preferences.

Familiar is defined as the way an individual believes that s/he is acquainted with what they perceive as a threat (Slovic, 1987). As knowledge increases, people tend to make better decisions and to formulate more consistent opinions. In the beginning of the pandemic, little information was in the hands of health professionals to understand COVID-19. However, as research advanced, more information was available online. This information has helped national governments to advise their populations, and to make more informed decisions. As preventive measures are now well defined, it is expected that travellers are aware of how to protect themselves against COVID-19, and they may feel more comfortable in their daily life, knowing what to do. Therefore, the greater the familiarity with the pandemic, the better they may perceive the attitude of traveling.

Recent research in Japan has evaluated threat appraisal as key factors on COVID-19 risk perception (Parady *et al.*, 2020). They found that level of dread increases the probability of reducing the number of trips. However, the effect of familiarity runs in the opposite direction, as the lower the familiarity, the higher the probability to travel (for leisure). Therefore, the following hypotheses are made:

H5a: Level of dread negatively affects attitudinal preferences.

H5b: Level of dread negatively affects the intention to fly.

H5c: Familiarity affects positively attitudinal preferences.

2.2.5. *Moderating Effect of Social Influence*

As mentioned before, social factors have caused fear amongst consumers during the pandemic. Past research has shown that fear starts to rise amongst consumers after seeing others expressing their concerns (Ahorsu *et al.*, 2020; Lamb *et al.*, 2013). The level of fear will directly influence each consumer's perception regarding travel during the pandemic (attitudinal preferences). The proposed hypothesis focuses on how the

influence of fear on attitudinal preferences is affected by social influence regarding the risks of COVID-19 transmission.

In other words, we suggest that social influence moderates the effects, such that negative effect of dread is greater in the presence of stronger social influence. Contemporary top research at Nature (Bavel *et al.*, 2020) indicates social and behavioural factors like social influence as important predictors to support COVID-19 pandemic response. Recent research in psychology and tourism (Tunçgenç *et al.*, 2021; Zhao and Bacao, 2020) indicates that social influence impacts how people follow guidelines in the pandemic, according to our closer social circle. That means that social influence could shape how people see air travel during the pandemic. We thus suggest that the more social influence from one's closer circle, the more chances to reduce attitudinal preferences towards trips, because it's one of the key factors on COVID-19 risk perception (Parady *et al.*, 2020). Therefore, we hypothesize that:

H6: The relationship between level of dread and attitudinal preferences is moderated by social influence, whereby the negative effect of dread is greater in the presence of stronger social influence.

3. Methodology

3.1. Data collection

The online survey had eight parts, seven of which referring to the variables mentioned in the literature: attitudinal preferences, social influence, self-efficacy, response cost, level of dread, and familiarity. The eighth section included demographic questions. The survey was applied in Portugal to people 18 years old and older. All respondents were residents of Portugal, so that everyone was subjected to the same policies and restrictions regarding the pandemic crisis. The survey was conducted through

Qualtrics™ platform. Before publishing the survey, the Institutional ethics committee validated all the questions. The survey was active from 4 November to 20 December 2020, which corresponds to the beginning of the COVID-19 second wave in Portugal and before the national mass vaccination process began. The sampling approach is a convenience sample using a snow-ball technique to distribute the electronic questionnaire (Baltar and Brunet, 2012).

All items in the sections of the survey were based on pre-validated studies on TPB and PMT, the questions were answered on a seven-point Likert Scale (1 = strongly disagree, 7 = strongly agree). Questions for the constructs of the TPB (attitudinal preferences, social influence, and intention to fly) were adapted from (Coşkun and Yetkin Özbük, 2020; Neto *et al.*, 2020). Questions for the constructs of PMT theory, namely coping appraisal (self-efficacy and response cost) were adapted from (Khazaei-Pool *et al.*, 2020; Prasetyo *et al.*, 2020). Questions for threat appraisal (level of dread and familiarity) were adapted from (Prasetyo *et al.*, 2020). Table 1 shows the measurement items per construct.

Table 1. Measurement items

Reference	Theory	Construct	Questions
(Coşkun and Yetkin Özbük, 2020; Neto <i>et al.</i> , 2020)	Theory of Planned Behaviour	Attitudinal Preferences	Flying during COVID-19 pandemic is not harmful to health Flying during COVID-19 pandemic is not bad Flying during COVID-19 is still satisfying
		Social Influence	My friends and family would approve of me flying during COVID-19 If my family and friends fly during COVID-19, I will also do it
		Intention	I intend to fly in the short-middle term I will keep flying in the short-middle term as regularly as I would do without the pandemic

(Khazae- Pool <i>et al.</i> , 2020; Prasetyo <i>et al.</i> , 2020)	Protection Motivation theory	Coping Appraisal (Self- Efficacy)	Preventive protocols are easy to implement The preventive protocols are completely up to me
		Coping Appraisal (Response Cost)	Protecting myself against coronavirus is time- consuming Washing my hand regularly makes my skin sensitive It is hard for me to breathe with a mask
		Threat Appraisal (Level of Dread)	Being infected can be serious There is a chance that my family will be infected after I fly I am very vulnerable to COVID -19
		Threat Appraisal (Familiarity)	I am aware of the symptoms of COVID-19 The pandemic in Portugal is more concerning than in other countries The pandemic will continue at least for 1 more year

In total 381 complete answers were collected. The sample size is adequate to evaluate the model using PLS-SEM. Previous studies provide evidence that PLS-SEM is appropriate to assess models using small to medium sample sizes (Ringle *et al.*, 2012). (Reinartz *et al.*, 2009) suggest that with a sample as low as 100 observations is possible to achieve acceptable statistical power. In addition, we comply with the rule of thumb of the sample size being at least ten times the largest number of structural paths directed to a latent construct (Hair *et al.*, 2017, 2011).

3.2. Sample demographics

We conducted data validation regarding outliers and detected none. Accordingly, all responses were kept in the study. Table 1 presents the demographic data of the respondents. The sample includes mainly young respondents, with 67% being less than 40 years old. The number of annual trips before the pandemic is similarly distributed across every interval. Twelve percent of the study's sample

affirmed suffering from health conditions, which includes them in the risk group. In terms of household size, more than half of the respondents reported having between three and four people. Finally, nearly half of the respondents (48.6%) affirmed to have travelled since the beginning of the pandemic.

We split the sample into two groups, one with respondents who had not travelled since the beginning of the pandemic situation, and the other with those who had taken at least one flight since the crisis began. A multi-group analysis (MGA) was employed to study the differences between the groups, the main purpose being to detect differences (should they exist) regarding attitudinal preferences, social influence, the level of dread, and the intention to fly.

Table 1. Demographic data of respondents (N=381)

Demographic Variable	Types	Frequency	Percentage (%)
Gender	Male	242	63.5
	Female	138	36.2
	Undisclosed	1	0.3
Age	18-29	136	35.7
	30-39	121	31.7
	40-49	75	19.7
	50-59	37	9.7
	60-69	11	2.9
	70-79	1	0.3
	≥80	0	0.0
Suffer from any disease?	Yes	47	12.3
	No	334	87.7
Number of annual trips before the pandemic	0-2	67	17.6
	3-5	68	17.9
	6-8	79	20.7
	9-11	48	12.6
	12-14	26	6.8
	15-17	21	5.5
	≥18	72	18.9
Household	1	39	10.2
	2	90	23.6
	3	103	27.0
	4	113	29.7

	5	30	7.9
	6	2	0.5
	≥7	4	1.1
Income	0€-699€	9	2.4
	700€-1399€	70	18.4
	1400€-2099€	98	25.7
	2100€-2799€	87	22.8
	2800€-3499€	49	12.9
	3500€-4199€	24	6.3
	≥4200€	44	11.5
Has travelled since the beginning of the pandemic	Yes	185	48.6
	No	196	51.4

3.3. Model quality assessment

Given the complexity and exploratory nature of the proposed model, PLS-SEM was indicated as the best option to study the intention to fly in our sample (Hair *et al.*, 2019). PLS-SEM is also the most indicated statistical model to improve research based on theoretical frameworks, contributing to their development and understanding.

Discriminant validity is defined as the degree of correlation between constructs that should not be related to each other. To assure discriminant validity in our model, we rely upon the Fornell-Larcker and Heterotrait-Monotrait Ratio (HTMT) methods. The collinearity was assessed using the variance inflation factor (VIF). The highest outer VIF value was 3.27, thus confirming that our model has no collinearity issues ($VIF < 5$) (Hair *et al.*, 2017).

The Fornell-Larcker criterion (Fornell and Larcker, 1981) assesses the discriminant validity by comparing the square root of the average variance extracted (AVE) and the correlation of latent constructs. The square root of AVE should be greater than its highest correlation with other constructs (the elements in the

corresponding row and column). Table 2 shows the square roots of the AVE on the diagonal.

Table 2. Fornell-Larcker Discriminant Validity

Constructs	1	2	3	4	5	6	8
1. Attitudinal Preferences	0.896						
2. Familiarity	0.146	0.721					
3. Intention to Fly	0.696	0.141	0.925				
4. Level of Dread	-0.174	0.258	-0.106	0.721			
5. Response Cost	-0.364	-0.165	-0.283	-0.096	0.758		
6. Self-efficacy	0.310	0.192	0.380	0.185	-0.233	0.880	
7. Social Influence	0.771	0.071	0.719	-0.188	-0.309	0.341	0.899

The Heterotrait-Monotrait Ratio must be less than 1.00 (Henseler *et al.*, 2015). All values for the HTMT assessment are below that value (Table 3). Regarding the Partial Least Squares (PLS), we analysed the loadings of the variables (Table 4). Constructor loadings ranged from 0.545 to 0.977.

Table 3. Heterotrait-Monotrait Ratio

	1	2	3	4	5	6	7
1. Attitudinal Preferences							
2. Familiarity	0.166						
3. Intention to Fly	0.814	0.154					
4. Level of Dread	0.153	0.378	0.148				
5. Response Cost	0.451	0.233	0.359	0.191			
6. Self-efficacy	0.386	0.290	0.488	0.351	0.353		
7. Social Influence	0.941	0.097	0.902	0.230	0.409	0.463	

Table 4. Descriptive Statistics (N = 381)

Construct	CA	CR	AVE	Item	Mean	Standard Deviation	Loading
Attitudinal Preferences	0.877	0.925	0.804	ATT1	5.171	1.758	0.867
				ATT2	5.218	1.784	0.931
				ATT3	4.958	1.819	0.890
Familiarity	0.610	0.759	0.519	FAM1	6.441	0.810	0.573
				FAM2	6.346	0.999	0.679
				FAM3	5.961	1.420	0.877
Intention to Fly	0.832	0.922	0.856	INT1	5.039	1.986	0.922

				INT3	4.178	2.374	0.929
Level of Dread	0.656	0.750	0.520	DREAD1	6.213	1.344	0.545
				DREAD2	4.808	1.848	0.977
				DREAD3	3.625	1.631	0.555
Response Cost	0.646	0.800	0.575	REC1	2.373	1.529	0.612
				REC2	2.554	1.748	0.800
				REC3	3.118	1.860	0.843
Self-efficacy	0.713	0.873	0.775	SEF1	5.102	1.631	0.907
				SEF2	4.520	1.901	0.853
Social Influence	0.763	0.894	0.808	SOC1	4.693	2.024	0.892
				SOC2	5.383	1.918	0.906

4. Structural model assessment

4.1. Hypotheses testing

We evaluate the statistical significance of our hypothesis separately for each sample of respondents (NOT_Group and YES_Group). The first group (196 respondents) includes people who had not travelled since the beginning of the pandemic (NOT_Group); and the second group (185 respondents) includes people who had travelled by plane since the beginning of the pandemic (YES_Group). The bootstrapping technique with 5000 iterations is used to estimate the PLS path model at 0.05 significance level (Hair *et al.*, 2017). Six hypotheses were accepted in both groups, but not the same hypotheses for each group. Regardless of the group, the positive relationship of social influence on attitudinal preferences is undoubtedly the strongest relationship in the model (although with a significant difference in strength), followed by the positive relationship of attitudinal preferences and social influence on intention to fly. Self-efficacy was found to be statistically significant and positive on intention to fly for both groups. On the other hand, level of dread was not significant for any of the groups. As discrepancies, the influence of the level of dread and response cost on attitudinal preferences are statistically significant only for the NOT_Group. See Figures 2 and 3 for the results in

the path coefficients (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$). Dashed indicates hypothesis rejected) and Table 5 for a summary of the hypotheses results.

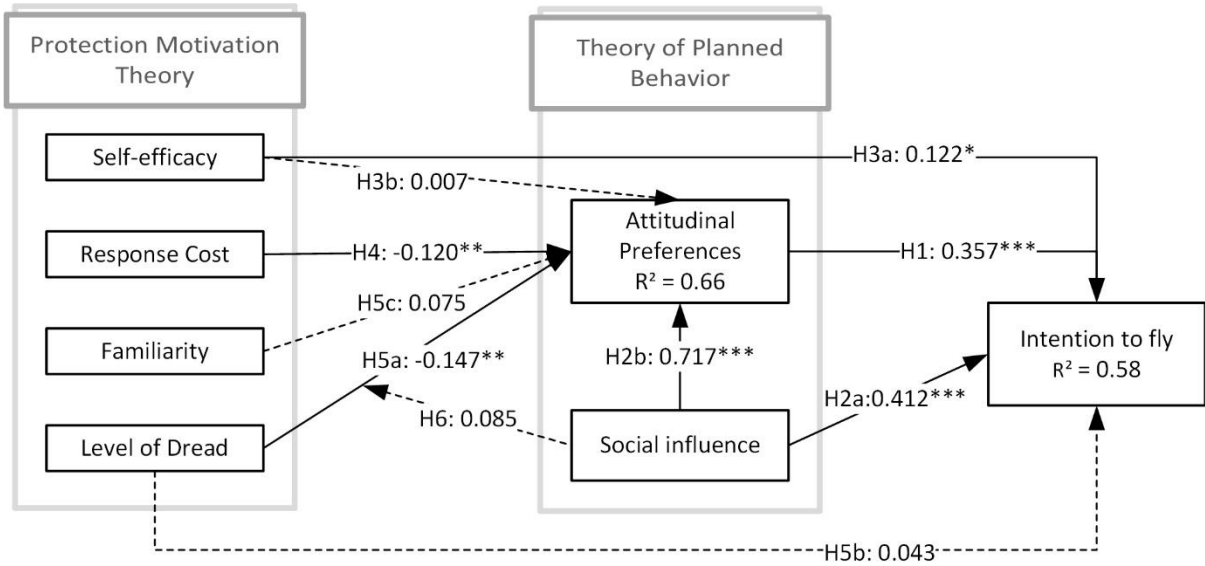


Figure 2. Multi-group Analysis Results of respondents who have not travelled during the pandemic (NOT_Group = 196)

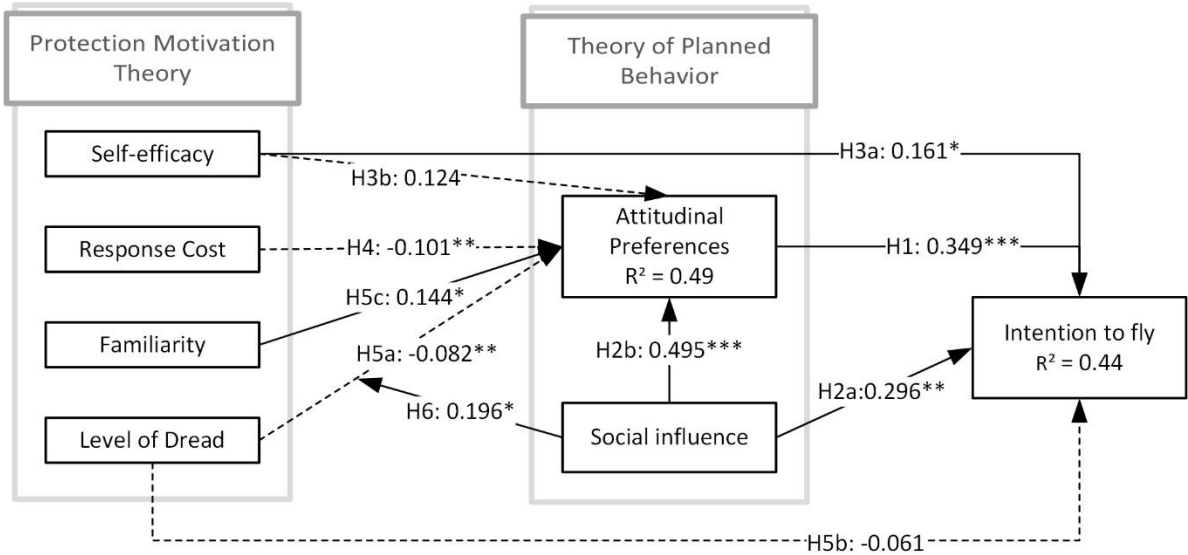


Figure 3. Multi-group Analysis Results of respondents who had travelled during the pandemic (YES_Group = 185)

Table 5. Summary of hypotheses results

Hypotheses	Supported or rejected
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	NOT_Group (N=196)	YES_Group (N=185)
H1	Supported	Supported
H2b	Supported	Supported
H2a	Supported	Supported
H3a	Supported	Supported
H3b	Not supported	Not supported
H4	Not supported	Supported
H5a	Not supported	Supported
H5b	Not supported	Not supported
H5c	Supported	Not supported
H6	Supported	Not supported

4.2. Moderator analysis

When the relationship between two constructs “depends on the values of a third variable” (Hair *et al.*, 2017, p. 243), we call it moderation. The moderation of social influence over the relationship between level of dread and attitudinal preferences is statistically significant only for the YES_Group ($\beta = 0.196$, $p\text{-value} < 0.05$). Which means that even though level of dread does not have any significant effect on attitudinal preferences, this relationship may become significant in the presence of high values of social influence.

4.3. Multi-group analysis

Individual differences between respondents, such as gender, will lead to different numerical results on the path coefficients (Hair *et al.*, 2017). The multi-group analysis tests whether these numerical differences are statistically significant or not. Although the numerical differences between the two groups (NOT_Group and YES_Group) are evident, they are not statistically significant, except for the relationship between social influence and attitudinal preferences, in which the difference regarding the strength of relationship is statistically significant. Please see Table 6.

Table 6. Multi-group Analysis Results. Significant differences in bold.

Path	NOT_Group (n=196)		YES_Group (N=185)		NOT_Group vs. YES_Group	
	β	p-Value	β	p-Value	β (Not - Yes)	p- Value
	Attitudinal Preferences -> Intention to Fly	0.357	0.000	0.349	0.000	0.008
Familiarity -> Attitudinal Preferences	0.075	0.226	0.144	0.031	-0.069	0.442
Level of Dread -> Attitudinal Preferences	-0.147	0.005	-0.082	0.348	-0.065	0.553
Level of Dread -> Intention to Fly	0.043	0.442	-0.061	0.530	0.103	0.341
Response Cost -> Attitudinal Preferences	-0.120	0.005	-0.101	0.252	-0.020	0.817
Self-efficacy -> Attitudinal Preferences	-0.007	0.898	0.124	0.105	-0.131	0.166
Self-efficacy -> Intention to Fly	0.122	0.047	0.161	0.015	-0.039	0.661
Soc_Inf X Dread -> Attitudinal Preferences	0.085	0.098	0.196	0.038	-0.111	0.321
Social Influence -> Attitudinal Preferences	0.717	0.000	0.495	0.000	0.221	0.011
Social Influence -> Intention to Fly	0.412	0.000	0.296	0.002	0.116	0.358

5. Discussion

This study deepens our understanding of intention to fly during the COVID-19 pandemic. Our findings contribute to the literature by joining the Theory of Planned Behaviour with the Protection Motivation Theory. The findings demonstrate that the integration of these theories sheds new light on the drivers of intention to fly. The TPB theory suggests that the consumers' intentions are driven by their personal attitudes, social influence, and perceived ease of coping with the behaviour (Ajzen, 1991). However, in the current pandemic situation we demonstrate that constructs from the PMT also play a role in explaining the intention to fly, extending the planned behaviour to a protected behaviour approach.

In the specific context of air travel, this research is the first to integrate both theories. Thus, our contribution lies on being the first research (to the best of the authors' knowledge) to integrate TPB and TMP theories in the context of air travel. Prior research has developed the early stages of research on TPB and TMP across

disciplines, mainly in the medical field, given the context of the preventive healthy behaviours (Ho and Sun, 2016; Powell *et al.*, 2016; Prasetyo *et al.*, 2020).

Recently, the PMT studies in tourism have boomed, because of the pandemic, notably the works of Rather, (2021); Seow, Choong, Chen, *et al.*, (2021); Seow, Choong, Moorthy *et al.* (2021); Wang *et al.* (2019). However, it is important to note that these studies did not merge both TPB with PMT. For instance, the most recent work from Seow, Choong, Choong, and Moorthy (2021) examines the effectiveness of the protection motivation theory with the influence of appraisals on intention to engage in tourism. The authors demonstrate that tourists' high-risk perception must be complemented by coping ability to produce a motivational response to threats related to tourism.

Our research contributes to this recent stream of literature on PMT by exploring several additional factors involved in tourism, such as testing attitudinal preferences and social influence, included in the TPB. Also, we provide a deeper understanding in the PMT, since we tested self-efficacy, response cost, familiarity, and level of dread on intentions to fly. By doing so, we also contribute to the work of Wang *et al.* (2019), applying PMT to explore travellers' self-protective behaviour against health risks. The authors reinforced previous PMT results, such that both threat and coping appraisals can enhance travellers' protection motivations and on how to encourage travellers to protect themselves against health risks. Finally, our findings contribute to Rather (2021) that applied PMT to investigate revisit intention in pandemic environment. The study also examined the moderation impact of fear of COVID-19 and perceived risk on revisit intention. In our case, we added to this study TPB variables and tested the moderating effect of social influence, which was not tested in these recent studies, thus further contributing to existing literature.

5.1. People who had not travelled during the pandemic

Our results show that the attitudinal preferences of people who had not travelled at the time of the enquiry (since the beginning of the pandemic) are sensitive to a negative influence of the response cost perception and the level of dread. A possible explanation for this can be the fear of the unknown. Since these consumers have not travelled yet (during the pandemic), their perceived fear may be causing a misconception of the actual experience of taking a flight during the pandemic crisis. Our finding is in line with those of Rather (2021), who found that fear of COVID-19 has a negative effect on attitude. Although these findings do not represent a truly optimistic view from these consumers, the attitudes and intentions of not wanting to take a flight due to a high level of fear were not as strongly negative as expected (Abdullah *et al.*, 2020; Hotle *et al.*, 2020; Lamb *et al.*, 2020; Rather, 2021b).

The attitudinal preferences, social influence, and self-efficacy drive the intention to fly. Our findings are in line with those of recent studies in the tourism context (Bae and Chang, 2020; Sánchez-Cañizares *et al.*, 2021). These findings may mean that although response cost and level of dread have a statistically significant and negative effect over attitudinal preferences, this negative effect is probably not enough to deter people from flying during the pandemic crisis. However, it may be an indication of a potential degree of stress and discomfort that those consumers expect if taking a flight during the pandemic situation.

Social influence does not statistically moderate the level of dread on attitudinal preferences. This probably means that people's ideas and perceptions about COVID-19 transmission and infection are already well-established from the beginning of the pandemic crisis and the social influence is no longer able to moderate the level of dread of attitudinal preferences.

5.2. People who have travelled during the pandemic

People who already experienced taking a flight since the pandemic crisis began and the safety measures were imposed showed that response cost and level of dread are no longer significant drivers of attitudinal preferences, while familiarity becomes significant. Our finding partially complements recent studies regarding the intention to travel. For instance, Luo & Lam (2020) found that fear of COVID-19 (level of dread) was not significant on travel intention when respondents were asked about traveling to countries with no-quarantine requirements. However, their study does not specify whether the respondents had or had not already travelled to those countries.

Our findings suggest that for people who already took a flight, unlike the group who did not travel, the level of fear and discomfort of protective measures had no impact on their attitudes toward flying. On the other hand, familiarity becomes statistically significant and positive on attitudinal preferences. Meaning that people who already took a flight during the pandemic already know what to expect and what procedures they should take to remain safe with minimum discomfort. Moreover, social influence plays a moderating effect on the influence of level of dread on attitudinal preferences. This may imply that third party opinions are at least partially important to keep their confidence in the travel experience in the near future.

5.3. Managerial implications

This research has several managerial implications for air travel. First, our findings provide new insights on air travel, such that tourism operators can develop air travel packages to target not-yet travellers with information that diminishes the tourist's fear and the discomfort arising from protective measures. For instance, our findings indicate that level of dread negatively impacts attitudes for not-yet travellers, compared to those

who already travelled during the pandemic. In this way, the results could be used to develop and apply new campaigns, including flights that provide more protective conditions to mitigate the level of dread related to the pandemic. Also, air travel can develop more routes to less crowded places, avoiding the risk perception from consumers in destinations where the virus prevalence is lower, or where there is some isolation (e.g., travel to smaller or remote cities). For instance, the air travel routes to places less visited (with less crowding) that were suspended after the COVID-19 outbreak could be gradually resumed in agreements with tourism operators, as such an arrangement could provide less business risk in their operation and more safety to consumers, that might prefer less crowded places after the pandemic.

Second, airlines could redefine their business strategies to convince consumers to fly again. Airlines are today facing their biggest crisis ever in history, with a decline of over 60% in the number of passengers worldwide (ICAO, 2021). Airlines should focus on promoting good health practices to show consumers who are not yet convinced that traveling by airplane is safe. One of our findings indicate that familiarity can play an important role to affect air travel decisions and might reduce the discomfort from safety measures adopted during the pandemic. The remaining routes that were suspended after the COVID-19 outbreak could be gradually resumed in agreements with tourism operators, as such an arrangement could provide less business risk in their operation.

Third, communication means could consider the fact that social influence has a substantial importance for both attitudes and travel intentions. Our findings suggest that for COVID-19 travellers social influence moderates the relationship between fear and attitudes. Therefore, it is important that the communication remains clear to avoid any misperception that leads to anxiety or fear, so that tourism does not lose its current

customers (i.e., post-pandemic air travellers). Lastly, reducing the amount of misleading information, such as fake news, might help to reduce negative social influence (Domenico *et al.*, 2021). For instance, to mitigate the spread of false information during the pandemic, Instagram has introduced automatic links on posts regarding the pandemic and vaccines, redirecting users to the WHO website (Instagram, 2020). This can be considered a positive measure to reduce negative social influence towards air travel and prevent the increase of fear from consumers to travel again and to better inform users.

6. Limitations and future research

Although this study provides some significant insights on travel intentions during the COVID-19 pandemic, there are also some limitations that should be addressed in future studies. We acknowledge the small representation of elderly consumers in the sample, making the demography of the study unbalanced. Older consumers are a very important market for airline and cruise companies, beach and rural markets, and health tourism. Recent research has shown that a higher age may be associated with a higher level of awareness and greater motivation for protection against COVID-19 (Ezati Rad *et al.*, 2021). Since fear plays an important role in this research, future research could investigate the reasoning behind the lack of significance of fear on intention to fly.

A higher representation of elderly respondents could have provided better insights on travel intentions and allowed us to study the differences amongst age groups. Another limitation of this study is the lack of distinction between the groups of people suffering from diseases. These consumers, who have fragile health conditions, could have different priorities and opinions on traveling due to their health condition. Since the pandemic is a health-related issue, it would be valuable for future researchers

to carry out a new multi-group analysis based on health reasons, instead of the past travel experience.

This study was conducted in Portugal, a member of the European Union (EU) and Schengen Area. Residents of the EU member states are allowed to travel between member states without major bureaucracy, and restrictions (in general) were and are similar across the EU countries. Any restrictions in relation to COVID-19 were applied only during the most challenging months for each country. Future research could conduct a similar study in a country with tighter border control and safety protocols and investigate if travel intentions would remain similar.

7. Conclusion

This study provides a new research model to study intention to fly in the context of the COVID-19 pandemic crisis. The new model joins the Theory of Planned Behaviour and Protection Motivation Theory. The results suggest that fear and discomfort are the main drivers of attitudes toward flying for people who had not travelled since the outbreak of the pandemic. However, these drivers lose significance once people experience taking a flight, and familiarity with the traveling procedure becomes the new significant and positive driver of attitude. Self-efficacy, attitudinal preferences, and social influence remain the main drivers of intention to fly for both groups of respondents. Tourism and airline companies should pay more attention to promotional campaigns that increase people's trust in air travel while the pandemic situation persists. Media companies should maintain high-quality communication in order to prevent misinformation and spread awareness instead of fear and anxiety.

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