COVID-19 pandemic and tourism: The impact of health risk perception and intolerance of uncertainty on travel intentions

Anastasiya Golets[a*], Jéssica Farias[b], Ronaldo Pilati[b], and Helena Costa[c]

[a]*Centre of Sustainable Development, University of Brasilia, Brasilia, Brazil*
[b]*Institute of Psychology, University of Brasilia, Brasilia, Brazil*
[c]*Faculty of Business Administration, Accounting, Economics and Public Policy Management, University of Brasilia, Brasilia, Brazil*

Anastasiya Golets
anastasiya.golets@gmail.com
Campus Universitário Darcy Ribeiro, Centro de Desenvolvimento Sustentável, Brasilia, DF, Brazil, ZIP Code: 70910-900.

Abstract

Understanding tourist behaviour during and after major tourism crises is essential to help destinations recover. The COVID-19 pandemic, a period of uncertainty and risk, makes it relevant to assess factors that influence travel intentions. There has been little research on tourist behaviour during health crises and, in particular, on perceived health risk and uncertainty effects on travel intentions. This study was carried out during the first months of the pandemic in Brazil and aims to investigate the role of health risk perception and intolerance of uncertainty on travel intentions for 2020 and 2021. We applied an online survey to 1,150 Brazilian participants from March to May of 2020. Our findings indicate that perceived COVID-19 severity, perceived probability of contracting it, and expected pandemic duration are significant predictors of travel intentions for both years. This paper sheds new light on tourist behaviour in the context of global health crises.

Keywords: COVID-19; pandemic; travel intentions; health risk perception; intolerance of uncertainty.

1. Introduction

The tourism industry is highly sensitive to risks of national, regional, or global dimensions, such as political instability, conflicts, terrorism, disease outbreaks, natural disasters (Hasan, Ismail & Islam, 2017). Sometimes the impact of risk events is so strong that it requires a

 doi:10.20944/preprints202010.0432.v1

coordinated action by governments, local authorities, tourism businesses, and associations to avoid serious socio-economic consequences for destinations affected by a drastic decrease in tourist activities. Understanding individuals' travel intentions in the context of risk is a crucial component in developing destination recovery strategies.

The COVID-19 pandemic is the worst crisis faced by international tourism since the 1950s when the records began. In the first half of 2020, international tourist arrivals dropped by 65%. This impact has already translated into a loss of about U$460 billion in export revenues from international tourism, around five times the financial loss of the 2009 global economic crisis. Also, it has put between 100 and 120 million direct tourism jobs at risk. According to UNWTO scenarios, the return to 2019 tourist arrivals levels would take from two to four years. (World Tourism Organization, 2020a; 2020b).

Brazil closed its land borders for foreigners on March 19, 2020, and air borders on March 27, 2020 (Mazui & Amato, 2020; Sarmento, 2020). Public Health Emergency of National Importance was declared by the Ministry of Health on February 3, 2020 (Ministério da Saúde, 2020). However, there has not been mandatory social isolation measures taken throughout the national territory, and different measures have been taken by states and municipalities depending on the local situation (Nascimento, 2020). On April 5, 2020, the day this research started, there were 9,056 confirmed cases and 359 deaths (World Health Organization, 2020). Less than three months later, on June 25, 2020, Latin America had emerged as the world's newest epicentre for COVID-19, with the regional death toll surpassing 100,000. More than half of these deaths happened in Brazil, where the numbers increased to 1,207,721 cases and 54,434 deaths (VOA News, 2020).

Brazil is a country whose members feel uncomfortable with uncertainty and ambiguity (Hofstede Insights, n.d.), which means that Brazilians tend to "feel threatened by ambiguous or unknown situations and create beliefs and institutions to avoid these". Therefore, a

 doi:10.20944/preprints202010.0432.v1

pandemic, which is a period of uncertainty and risk, could be particularly stressful to its population. Seeing that uncertainty can minimize the effectiveness of preparing for the future and contribute to anxiety (Grupe & Nitschke, 2013; Tanovic, Gee, & Joormann, 2018), the COVID-19 pandemic is expected to cause such detrimental effect on people in general, and, considering the high score on the cultural value of uncertainty avoidance, this effect is expected to hold even stronger in Brazil.

There has been hardly any research on the effect of uncertainty on tourism. Previous studies found that tourists from high uncertainty avoidance (UA) national cultures differ from the medium UA ones in planning, decision-making, trip duration, the main source of information used, and travel style (Money & Crotts, 2003; Litvin, Crotts & Hefner, 2004). Crotts (2004) also reported that trips to similar or different uncertainty avoidance national cultures have distinct characteristics. Reisinger and Mavondo (2005) found that UA influences the choice of a tourist destination. Notwithstanding, to the best of our knowledge, there has not been any research on the influence of intolerance of uncertainty (IU), which consists of an individual difference variable (Carleton, Norton, & Asmundson, 2007) on travel intentions.

This study was carried out during the first bimester of the COVID-19 pandemic in Brazil and aims at analysing the influence of disease severity and probability of infection perceptions as well as of the individual difference variable of IU on travel intentions for the years of 2020 and 2021. We also assess the effect of the expected duration of the pandemic, and of some sociodemographic measures (age, educational level, and income) on these intentions. The contribution of our study lies in shedding light on the psychological process that underlies traveller behaviour during crises and providing a deeper understanding of crisis-resistant tourists' characteristics, which is essential for destinations' post-crisis recovery.

 doi:10.20944/preprints202010.0432.v1

2. Theoretical framework

2.1 Uncertainty and tourist behaviour

Uncertainty avoidance (UA) consists of a cultural value that expresses the degree to which the members of a society feel uncomfortable with uncertain situations (Hofstede, Hofstede, & Minkov, 2010). High uncertainty avoidance cultures prize structure and feel threatened by the unknown and the ambiguous whereas low uncertainty avoidance cultures more willing to accepting risks (Litvin, Crotts, & Hefner, 2004). Some tourism and travel research has been conducted to investigate the influence of this cultural dimension on tourist behaviour. For instance, Money and Crotts (2003), in their study of travel styles of high and medium uncertainty avoidant national cultures, found that uncertainty-avoidant Japanese prefer to pre-package risk-reducing elements of the trip, while uncertainty-accepting Germans have a freer style of travelling. There is also a difference between travel parties: high UA tourists are more likely to travel in big groups of people.

The cultural dimension of uncertainty avoidance is assessed by the Uncertainty Avoidance Index (UAI), which rates 76 countries and regions, with a score ranging from 0 to 100. The lower the score, the less the country or region has the cultural value of uncertainty avoidance, and vice versa (Hofstede, Hofstede, & Minkov, 2010). In this rank, Brazil scores 76, which characterizes a high UA culture (Hofstede Insights, n.d.). Therefore, it is expected that, when facing ambiguity or uncertainty, Brazilians will tend to evade making choices to avoid discomfort.

Individuals differ in the degree to which they can stand aversive responses triggered by the perception of uncertainty and lack of information (Carleton et al., 2016). The tendency to consider the possibility of a negative event occurring as unacceptable, regardless of its probability of occurrence, is named intolerance of uncertainty (IU) (Carleton et al., 2007). Uncertainty can have detrimental effects on individuals since it can minimize the

 doi:10.20944/preprints202010.0432.v1

effectiveness of preparing for the future and contribute to anxiety (Grupe & Nitschke, 2013; Tanovic et al., 2018). In fact, IU is related to anxiety pathologies (Carleton et al., 2007). As Brazil is considered a high UA culture (Hofstede Insights, n.d.) we suppose that most Brazilians are uncertainty-intolerant and therefore we suggest that:

H1. Individuals who hold high IU are likely to avoid travelling during the COVID-19 pandemic.

2.2 Tourism and risk perception

There are several concepts of risk perception in tourism studies (Tsaur, Tzeng & Wang, 1997; Sönmez & Graefe, 1998a; Reichel, Fuchs & Uriely, 2007; Liu & Gao, 2008; Chen & Zhang, 2012). Despite little discordance in the academic literature, tourism risk perception is usually considered as a potential loss that arises from the uncertainty of the tourism activities results (Roehl & Fesenmaier, 1992; Sönmez & Graefe, 1998). It is related to a number of consequences in costumer behavior, like purchase intention (Liu et al., 2013; Mohseni et al., 2016), re(visit) intention (Rittichainuwat & Chakraborty, 2009; Chew & Jahari, 2014; Zhu & Deng, 2020), satisfaction (Quintal & Polczynski, 2010; Xie et al., 2020), loyalty (Casidy & Wymer, 2016; Chahal & Devi, 2017) etc.

Previous studies revealed that perceived tourism risk may decrease re(visit) intention in case of natural disasters (Lehto, Douglas & Park, 2008; Chew & Jahari, 2014; Rittichainuwat, Nelson, & Rahmafitria, 2018), terrorism (Sönmez & Graefe, 1998; Floyd et al., 2004; Adeloye & Brown, 2017), and diseases (Mizrachi & Fuchs, 2016; Novelli et al. 2018; Neuburger & Egger, 2020; Nazneen, Hong & Ud Din, 2020).

Health concerns in tourism have aroused growing academic interest in the past two decades (Hamer & Connor Bradley, 2004; Lopez-Velez & Bayas, 2007; Jonas, Mansfeld, Paz & Potasman, 2010; Novelli et al., 2018; Senbeto & Hon, 2020). Among all the perceived tourism-related risks, the health ones are reported to be one of the greatest influencers on

 doi:10.20944/preprints202010.0432.v1

tourist behavior (Sönmez & Graefe, 1998b; McKercher & Chon, 2004; Kozak et al., 2007; Chien et al., 2017; Novelli et al., 2018).

Senbeto and Hon (2020) have stated that major health crises, such as 2003 SARS and 2015 avian flu outbreaks, seem to impact tourist behaviour more than a financial crisis, bringing anxiety and influencing travel intentions regardless of tourists' profile. Recent studies addressing the COVID-19 pandemic (Nazneen, Hong & Ud Din, 2020; Neuburger & Egger, 2020) have confirmed the previous ones and showed that tourist health risk perception has increased, affecting negatively individuals' travel intentions.

To assess tourist health risk perception, several authors have proposed to consider perceived susceptibility, that is, the likelihood of acquiring a disease (Janz & Becker, 1984; Floyd et al., 2000; Brewer et al., 2007; Taymoori, Molina, & Roshani, 2014; Huang et al., 2020), and perceived severity, defined as severe negative impacts of the disease (Provost & Soto, 2002; Brewer et al., 2007; Huang, Dai & Xub, 2020). Greater perceived susceptibility and perceived severity can lead to health-preventative behaviours, like travel avoidance (Brewer et al., 2007; Chapman & Skinner, 2008; Huang et al., 2020).

To assess whether health risk perception influences tourist travel behaviour during and after the COVID-19 pandemic, we propose that:

H2. Individuals who perceive COVID-19 to be more severe will have weaker intentions of travelling in 2020 and 2021.

H3. Individuals who perceive the probability of contracting COVID-19 as high will have weaker intentions of travelling in 2020 and 2021.

Li, Nguyen, and Coca-Stefaniak (2020) have used expected outbreak duration as a variable to predict post-COVID-19 pandemic tourist behaviour. The longer the outbreak is expected to last, the least strong travel intentions tend to be. By considering this rationale, we hypothesize that:

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 October 2020 doi:10.20944/preprints202010.0432.v1

H4. Individuals who expect the COVID-19 pandemic to last longer will have weaker intentions of travelling in 2020 and 2021.

2.3 Other determinants of travel intentions

Several studies on tourist behaviour have found that some individual characteristics may affect travel intentions. Variables such as age (Khan, Chelliah & Ahmed,2018; Hajibaba et al., 2015; Neuburger & Egger, 2020), travel experience (Sönmez & Graefe, 1998a; Kozak et al., 2007; Polas et al., 2019), income (Sönmez & Graefe, 1998b; Floyd et al., 2004; Djeri, Armenski, Jovanović & Dragin, 2014; Li, Mengdie & Cheng, 2018) and education level were relevant predictors of travel intentions also during periods of crises.

Travel experience. Previous studies have shown that more experienced tourists tend to have stronger intentions of travelling during periods of crises (Sönmez & Graefe, 1998b; Floyd et al., 2004; Reichel, Fuchs, & Uriely, 2007; Rittichainuwat & Chakraborty, 2009). Travel experience decreases tourist risk perception and, at the same time, positively influences travel intentions (Sönmez & Graefe, 1998a; Kozak et al., 2007; Rittichainuwat & Chakraborty, 2009; Polas et al., 2019; Neuburger & Egger, 2020). In a similar vein, past travel experience seems to provide a greater sense of safety to tourists (Reza & Samiei, 2012) and alters travel decisions more than information from external sources (Rittichainuwat & Chakraborty, 2009). In line with Sönmez and Graefe (1998a) as well as Rittichainuwat and Chakraborty (2009), we hypothesize that:

H5. Individuals with more international travel experience will tend to have stronger travel intentions for 2020 and 2021.

Age. Khan, Chelliah, and Ahmed (2018) and Hajibaba et al. (2015) found that age was a predictor of tourist risk perception and travel intentions. They discovered that younger tourists were less concerned about physical tourism-related risks and showed more travel intentions. Chew and Jahari (2014) concluded that young individuals were more short-time

 doi:10.20944/preprints202010.0432.v1

oriented and likely to visit a post-disaster destination. While Senbeto and Hon (2020) found a greater sensitivity to the 2003 SARS outbreak among the elderly, Kozak et al. (2007) and Neuburger and Egger (2020) observed that older people were less likely to change their travel plans in the face of a risk threat. By considering this rationale, we suggest that:

H6. Younger individuals will tend to have stronger travel intentions for 2020 and 2021.

Income. Higher income levels were associated with stronger travel intentions. Studies have shown that there is a relationship between income and travel intentions both in risky and riskless times (Sönmez & Graefe, 1998b; Floyd et al., 2004; Djeri et al., 2014; Li, Mengdie & Cheng, 2018). In a riskless context, Djeri et al. (2014) found that individuals with a higher income spend their free time in a more active way than those with a lower income, which implies more frequent travelling among the former. In a risky context, Floyd et al. (2004) discovered that among the socio-demographic variables, income was the single predictor of travel intentions in the aftermaths of a terrorist act. Therefore, it is conceivable that individuals holding higher income levels be more likely to travel in the face of the COVID-19 pandemic.

H7. Individuals with higher income will tend to have stronger travel intentions for 2020 and 2021.

Education level. Tourist concern for safety declines as the education levels increase. This has been supported by Qi, Gibson, and Zhang (2009), who argue that travellers with higher education levels tend to be more adventurous and to travel despite possible risks. Graburn (1983) states that tourists with more years of education are mostly in search of new experiences and are more likely to explore. Besides, more educated tourists show more positive travel attitudes when there are possible risks involved (Sönmez & Graefe, 1998b). Based on this information, we hypothesize that:

 doi:10.20944/preprints202010.0432.v1

H8. Individuals with a greater educational level will tend to have stronger travel intentions in 2020 and 2021.

3. Method

3.1 Participants

Participants were obtained through convenience sampling. A total of 1,163 participants answered an online questionnaire, of which 13 participants were removed from the sample. There were 810 women (70.43%), 331 men (28.78%), and nine participants who did not report gender (0.78%). The mean age was 39.22 (SD=12.42), ranging from 18 to 80 years. As for income, the most cited income bracket (n= 354) was from four to ten minimum wages. Our sample is highly educated, for 591 (51.39%) participants checked the graduate option, meaning they either are postgraduate students or have already finished a postgraduate degree; and 387 (33.65%) indicated to have finished an undergraduate degree. Our sample has considerable domestic travel experience, for 836 (72.68 %) participants took six or more trips over the past five years. They also have some international experience, for 395 (34,34%) made six or more trips over the past five years. There were participants from all the 26 Brazilian states and the Federal District. Most of them were from the State of São Paulo and the Federal District (28.08% and 21.04%, respectively). Detailed sociodemographic characteristics are illustrated in Table 1.

[Table 1 near here]

3.2 Measures

3.2.1 Travel plans.

Two closed-ended questions about whether participants had actual travel plans for the years of 2020 and 2021. Participants answered in a binary way, by either answering yes or no. We also asked two questions about whether COVID-19 had affected their travel plans for 2020

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 October 2020 doi:10.20944/preprints202010.0432.v1

and 2021. Participants answered in a binary way, by either stating yes or no. Additionally, we applied two closed-ended questions to the participants who answered yes in the previous question that comprised three options: Trip cancelled, trip rescheduled, and other.

3.2.2 Travel intentions.

This measure consists of two scales that were developed in the scope of this research. They consisted of three items in which participants stated how likely they were to travel in 2020 and 2021. To assess whether the answers would differ in the two years, the separate scales with the same items were applied. The scale was scored at five points (1 = No intention, 2= Low intention, 3= Average intention, 4= High intention, and 5= Very high intention). Items were as such "state your intentions of travelling in the year of 2020". The higher the score was, the stronger the intentions of travelling were. The Cronbach's α coefficient of the scales was .73 and .79 for travel intentions in 2020 and 2021, respectively.

3.2.3 Past travel experience.

This measure was developed in the scope of this study to assess participants' previous travel experience. Participants answered three items about the frequency they had travelled to (1) cities of the state where they live, to (2) other Brazilian states, and to (3) other countries. The measure was scored at 5 points (1= Never, 2= Up to five times, 3 = Up to 10 times, 4 = Up to 20 times, and 5 = More than 20 times).

3.2.4 Perceived severity of COVID-19.

This scale was developed in the scope of this research and was composed of five items. One example of an item is "I believe that if I contract COVID-19, it will bring severe detrimental consequences to my life" and "I believe that if I contract COVID-19, my health would not be significantly affected". The scale was scored at five points (1= Strongly disagree, 2= Partially disagree, 3= Neither agree nor disagree, 4= Partially agree, and 5= Strongly agree). The Cronbach's α coefficient of the scale was .84.

 doi:10.20944/preprints202010.0432.v1

3.2.5 Perceived probability of infection.

Three items were conceived in the scope of this research to assess participants' perceived probability of infection when travelling in 2020 and 2021. One example of an item is "I believe that if I travel in 2020 there is a high risk of contracting COVID-19". The 5-point scoring was adopted (1= Strongly disagree, 2= Partially disagree, 3= Neither agree nor disagree, 4= Partially agree, and 5= Strongly agree). The Cronbach's α coefficient of the scales was .58 and .60 for the perceived probability of infection in 2020 and 2021, respectively.

3.2.6 Expected duration of COVID-19 pandemic.

One item aimed at assessing participants' expectations about the duration of the pandemic. The answers were scored at eight points (1= One month, 2= Two months, 3= Three months, 4= Four months, 5= Five months, 6= Six months, 7= Up to one year, and 8= Over one year).

3.2.7 IUS-12 (Intolerance of Uncertainty Scale, Short Version).

The short version of the IUS-12 (Intolerance of Uncertainty Scale) adapted by Carleton et al. (2007) was used. The scale is comprised of 12 items that are grouped into two dimensions (prospective anxiety and inhibitory anxiety). The 5-point scoring was adopted (1= Totally disagree, 5= Totally agree). The higher the score was, the higher was the participants' uncertainty avoidance level. The Cronbach's α coefficient of the scale was .91. The ones of prospective anxiety inhibitory anxiety were both .85. The results of s confirmatory factor analysis showed that the construct validity was good: CFI = .97, RMSEA = .06, SRMR = .04 (Carleton et al., 2007).

3.2.8 Sociodemographic measure.

Questions about income, gender, age, educational level, and gender were applied. Income was measured in a scale ranging from "no income" to "above 20 minimal wages" (1= Up to two minimum wages, 2= From two minimum wages to four minimum wages, 3= From four

 doi:10.20944/preprints202010.0432.v1

minimum wages to 10 minimum wages, 4= From 10 minimum wages to 20 wages, 5= Above 20 minimum wages). The current minimum wage in Brazil is R$1,045, which is equivalent to US$ 199.65. Gender was assessed through a closed-ended question with three options (1- Male, 2- Female, 3- Other). The question about age was open-ended. As for education, participants answered a 7-point scale (1= Unfinished elementary school, 2= Finished elementary school, 3= Did not finish high school, 4= Finished high school, 5= Did not finish undergraduate degree, 6= Finished undergraduate degree, and 7= Post-graduation). Gender was assessed at a 3-point scale (1= Male, 2= Female, and 3=Other).

3.3 Procedure

The questionnaire was applied online during the period of the pandemic (late March/early May). Participants were invited to respond to the research through posts in a social network, invitations in a messaging app, and e-mails. The study followed the ethical guidelines of research with human subjects. The collected data were sorted in SPSS 22 and analysed in Amos Graphics 21.

4. Results

When it comes to participants' travel plans for 2020, most participants (70.76%, n= 823) stated that COVID-19 has affected their travel plans while 29.23% (n= 340) said it did not. Out of the ones who stated to have travel plans, 749 participants answered about how the COVID-19 pandemic had affected their plans. Most of them (56.32%) stated they had rescheduled their trip and 36.58% said they had cancelled it. The remaining 7.00% reported other types of alterations. As for 2021, an even higher percentage (81.94%, n= 953) reported having travel plans whereas 18.06% (n= 210) did not report any. Out of the ones who stated that they have travel plans for this year, 270 answered that have altered their plans. The observed intentions for 2020 were similar to the ones for 2021, with most participants

 doi:10.20944/preprints202010.0432.v1

(51.12%) indicating that they had chosen to reschedule their travels to the detriment of cancelling (11.85%) them. The remaining 37.03% reported other types of alterations. These results confronted our expectations that, since Brazil consists of a culture with a high score in the cultural value of uncertainty avoidance, Brazilians would tend to opt for cancelling their trips instead of postponing them.

To test the effect of a variety on travel intentions for 2020, a path analysis was performed. We evaluated the assumptions of multivariate normality and linearity through SPSS 12.0. The criterion in this model consists of the answers to the Travel Intentions measure while the antecedent variables comprise Perceived Severity of COVID-19, Perceived probability of infection, Expected Duration of COVID-19 Pandemic, Intolerance of Uncertainty (IU) scores, Past Travel Experience, and sociodemographic variables (income, age, and educational level). Means and intercepts have been estimated for missing data.

We evaluated the assumptions of multivariate normality and linearity. Using box plots and Mahalanobis distance, we observed 13 multivariate outliers that have been removed from the sample. The theoretical model is presented in Figure 1. The hypothesized model appears to be a good fit to the data. The chi-square is 12.60, df = 9, p= .18; CFI is .99; and RMSEA is .02. We did not conduct post-hoc modifications because of the good fit of the data to the model.

[Figure 1 near here]

As to Hypothesis 1, no evidence has been found that IU consists of a significant predictor of travel intentions for 2020, t(1, 163) = -.52, b = -.01, p = .61. Therefore, it has been rejected. Travel experience (Hypothesis 5), t(1, 163) = 1.42, b = .04, p = .15, age (Hypothesis 6), t(1, 163) = -1.21, b = -.003, p = .22, and income (Hypothesis 7), t(1, 163) = -.93, b = -.05, p = .92, have also not been found to be significant predictors of those intentions. On the other hand, individuals with greater educational level (Hypothesis 8), t(1, 163) = -3.21,

 doi:10.20944/preprints202010.0432.v1

b = -.09, p = .001, who perceived the pandemic to be more severe (Hypothesis 2), t(1, 163) = -2.65, b = -.08, p = .008, perceived a high probability of infection (Hypothesis 3), t(1, 163) = -8.44, b = -.26, p < .001, and expected the pandemic to last longer (Hypothesis 4), t(1, 163) = -6.73, b = -.19, p < .001, had significantly weaker intentions of travelling.

To test the role of the same predictors in travel intentions for 2021, another path analysis was performed. The model presented a good fit: chi-square = 20.38, df = 11, p= .04, CFI= .99, RMSEA= .07.

[Figure 2 near here]

When it comes to Hypothesis 1 and 2, there has been no significant evidence to support that IU and the perceived severity of the pandemic consist of significant predictors of travel intentions for 2021, t(1, 163) = -.17, b = -.005, p = .86 and t(1, 163) = -.52, b = -.22, p = .60. Hypotheses 3 and 4 have been supported since perceiving a high probability of infection, t(1, 163) = -7.20, b = -.26, p < .001, and expecting the pandemic to last longer, t(1, 163) = -4.24, b = -.12, p < .001, predicted significantly weaker intentions of travelling in 2021. Hypotheses 5 and 7 have been supported, for travel experience, t(1,150) = 3.26, b = .11, p = .001, income, t(1,150) = 3.18, b = .11, p = .001, have been found significant predictors of stronger travel intentions. Conversely, Hypothesis 6 and 8 has been rejected since educational level, t(1,150) = -1.81, b = -.005, p = .007, has been a marginally significant predictor of weaker intentions of travelling, not the other way around, and age t(1, 163) = -.81, b = -.02, p = .42, has not been found a significant predictor of those intentions. Finally, to further investigate the relationship between educational level and the expected duration of the pandemic, we have conducted a regression analysis. Educational level has been found to be a significant predictor of expected duration of the COVID-19 pandemic, t(1,150) = 2.68, b = .20, p = .008, R^2 = .006, in that more educated people expect the pandemic to last longer.

 doi:10.20944/preprints202010.0432.v1

5. Discussion

5.1 Theoretical contributions

In this study, we aimed at assessing variables related to the COVID-19 pandemic that have an impact on travel plans. Specifically, this study assessed the effect of uncertainty, health risk perceptions (severity of COVID-19 and likelihood of contracting it), and perceived duration of the outbreak on Brazilians' travel intentions for the years 2020 and 2021. We also evaluated the impact of individual variables (age, educational level, and income) on these intentions. This research, therefore, sheds light on psychological processes that underlie traveller behaviour during crises and provide a deeper understanding of crisis-resistant tourists' characteristics.

Considering that Brazil ranks high on UA (Hofstede Insights, n.d.) and thus is expected to have a large number of uncertainty-intolerant individuals, we expected that participants would be more prone to cancelling their trips to avoid uncertainty. However, we found that Brazilians tended to reschedule their trips in uncertain times to the detriment of cancelling them. In search of a plausible explanation for this unexpected result, we came to consider the prospect theory, which is a psychological theory that states that individuals are generally risk-seeking when dealing with possible losses but risk-averse when dealing with gains (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). That is, people tend to accept running more risks to avoid possible losses if compared to running risks to obtain potential gains.

While rescheduling trips is usually free of charges, cancelations frequently require that high fees be discounted from the amount to be reimbursed, which incur losses to travellers. Therefore, participants may have opted for a riskier decision (rescheduling), besides other reasons, to avoid paying cancellation fees. Additionally, Hardisty and Pfeffer (2016) found that individuals preferred future gains and losses if the present was uncertain. Since the

 doi:10.20944/preprints202010.0432.v1

present is uncertain, individuals may have tended to opt for postponing their travels to avoid immediate losses represented by the fees charged by the air companies and tourism agencies.

We also hypothesized that highly uncertainty-intolerant individuals would be more likely to avoid travelling in risky times, a hypothesis that has also been refuted. We did not find IU to be a significant predictor of travel intentions for either 2020 or 2021. As to the impact of individual characteristics on Brazilians' travel intentions, we discovered supporting evidence that in post-crisis times of lower uncertainty, represented by 2021 in this study — since 66,80% of participants believed that the pandemic would last up to 6 months, that is, until September-October 2020 —, travel experience and income are significant predictors of travel intentions. As reported by several studies (Sönmez & Graefe, 1998b; Floyd et al., 2004; Kozak et al., 2007; Reza & Samiei, 2012; Polas et al., 2019; Neuburger & Egger, 2020), tourists with more extensive travel experience are more likely to travel in risky situations.

Our findings are also in line with the reports that income levels are significant predictors of tourist decisions in risky and riskless contexts (Sönmez & Graefe, 1998b; Li et al., 2018; Djeri et al., 2020). The year 2021 may have been perceived by some participants as a less risky post-pandemic period. And, as reported by Floyd et al. (2004), individuals with high income are more likely to travel in post-disaster periods. As to the effect of educational level on travel intentions for 2021, our results contradict the reports that individuals with higher educational levels tend to travel more in risky situations (Sönmez & Graefe, 1998b; Qi, Gibson, & Zhang, 2009). To further investigate why this may be the reason we have found this contrasting result, we have conducted a regression analysis to assess the relationship between educational level and the expected duration of the pandemic, finding that more educated individuals expected the pandemic to last longer. We assume that this may be the case because people that are more educated tend to have more positive attitudes towards science (Evans & Durant, 1995; Hayes & Tariq, 2000; Pardo & Calvo, 2002; Allum et al.,

 doi:10.20944/preprints202010.0432.v1

2008). By considering the scientific evidence, these individuals may have predicted that the pandemic would be taking place in 2021 and therefore have weaker intentions of travelling this year.

We have not been able to support the findings reported by Senbeto and Hon (2020), pointing out that older tourists showed a decrease in taking trips even after the 2003 SARS outbreak and the 2015 avian flu outbreak in Hong Kong. Gibson and Yiannakis (2002), as well as Williams and Baláž (2013), also stated that younger tourists are more likely to travel in the face of risks in comparison with older ones. The absence of a significant relationship between age and travel intentions during the pandemic is an unexpected result, for older individuals are more at risk of developing more severe symptoms of COVID-19 (Kluge, 2020).

In line with Provost and Soto (2002) and Huang et al. (2020), a health risk variable (probability of infection) and the expected duration of the COVID-19 pandemic have been found the strongest predictors of travel intentions for both 2020 and 2021. The perceived severity of the disease, however, was only significant for the year 2020. This may be because most participants (66.80%) expected the pandemic to last up to six months, that is, to end before 2021. The findings are consistent with previous evidence, which pointed health risk as having a significant effect on traveller behaviour (Sönmez & Graefe, 1998b; McKercher & Chon, 2004; Kozak, Crotts & Law, 2007; Rittichainuwat & Chakraborty, 2009; Chien, Sharifpour, Ritchie & Watson, 2017; Novelli, Gussing Burgess, Jones & Ritchie, 2018; Neuburger & Egger, 2020).

5.2 Practical contributions

This study has revealed that health risk perception variables, namely perceived severity of the disease, probability of contracting it, and expected duration of the pandemic were the most influential factors on weaker travel intentions in 2020 and 2021. We, therefore, provided

 doi:10.20944/preprints202010.0432.v1

evidence to the relevance of adopting health risk prevention measures in tourist destinations to increase travel intentions. Travel experience and income also appear to be relevant in a post-crisis period (in 2021). By considering this information, the tourism industry is advised to focus on travellers of high income in the post-pandemic period, considering the economic instability that is already affecting or will affect the most part of the Brazilian population. Highly educated individuals, however, seem to be prone to not travel during the pandemic as well as in a recent post-pandemic period. Another contribution consisted of providing information about how actual travel plans for the years 2020 and 2021 have been affected by the pandemic. By bearing this data in mind, it is possible to draw a clearer picture of the impact of COVID-19 on Brazilians' travel plans.

6. Limitations and future research

This research has some limitations. The sample is skewed in terms of gender (70.33% were female) and education (51.16 % were either postgraduate students or had a postgraduate degree). Nevertheless, these limitations reflect the convenience sampling nature of our data collection, which made it impossible to acquire a sample that reflects the same features of the Brazilian population in a similar proportion. We, therefore, suggest that future research be conducted to replicate our research design with a sample that is more balanced in terms of the Brazilian population features to verify whether our results will stand.

Another limitation lies in the fact that the research was carried out at the beginning of the COVID-19 outbreak in Brazil (late March/ early May 2020). This temporal component may have influenced the results. Therefore, it is highly advisable that further research be conducted in other phases of the pandemic. Besides, we suggest that future studies look into the effect of attitude toward science on travel intentions, for our results indicate that this variable may have an impact on travel intentions, especially in the face of health risks.

 doi:10.20944/preprints202010.0432.v1

Some of the findings on which we have based our hypothesis have not been replicated in our research, for instance, the relation between age and travel intentions. The reason for these opposing results may also lie in the nature of our sample, however being the result of cultural differences. Most of the claims about human behaviour are based on samples taken entirely from western, educated, industrialized, wealthy, and democratic (WEIRD) societies (Henrich, Heine, & Norenzayan, 2010). Therefore, our unexpected results may confirm that behavioral patterns typical from WEIRD societies may not be found in non-WEIRD ones. For this reason, we strongly suggest that other studies be conducted in other non-WEIRD countries to check whether these contrasting results may be a result of cultural differences.

7. Conclusion

To the best of our knowledge, this is the first multiple variable study to evaluate travel intentions of Brazilians during the COVID-19 pandemic. Our findings have some implications for tourism practitioners and authorities because it allows tracing the traveller profile that can help destinations to recover faster. Since Brazil ranks among the 20 countries with the greatest international tourism expenditures (The World Bank, 2020), it is important to comprehend the behaviour of Brazilian tourists during health crises. We have gone some way towards deepening the understanding of tourist behaviour during health crises, in particular, the COVID-19 pandemic. Having a clearer understanding of psychological processes that underlie travel behaviour during crises may support the elaboration of private strategies for recovering tourism companies as well as public policies that have the potential to assist in a faster recovery of the tourism industry after the pandemic is over.

Declarations of interest: none.

Acknowledgments

We thank the Brazilian Ministry of Tourism and the Brazilian Tour Operators Association (Braztoa) for their support in data collection.

Funding

This work was partly supported by the Coordination for the Improvement of Higher Education Personnel (CAPES) under Scholarship number 88887.356876/2019-00; and the National Council for Scientific and Technological Development (CNPq) under Grant number 308268/2016-4.

References

Adeloye, D., & Brown, L. (2017). Terrorism and domestic tourist risk perceptions. *Journal of Tourism and Cultural Change*, 16(3), 217–233. https://doi:10.1080/14766825.2017.1304399.

Allum, N., Sturgis, P., Tabourazi, D., & Brunton-Smith, I. (2008). Science knowledge and attitudes across cultures: a meta-analysis. *Public Understanding of Science*, 17(1), 35–54. https://doi:10.1177/0963662506070159.

Bae, S. Y., & Chang, P.-J. (2020). The effect of coronavirus disease-19 (COVID-19) risk perception on behavioral intention towards "untact" tourism in South Korea during the first wave of the pandemic (March 2020). *Current Issues in Tourism*, 1–19. https://doi:10.1080/13683500.2020.1798895.

Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. *Health Psychology*, 26(2), 136–145. https://doi.org/10.1037/0278-6133.26.2.136.

Carleton, R. N., Duranceau, S., Shulman, E. P., Zerff, M., Gonzales, J., & Mishra, S. (2016). Self-reported intolerance of uncertainty and behavioral decisions. *Journal of Behavior Therapy and Experimental Psychiatry*, 51, 58–65. https://doi.org/10.1016/j.jbtep.2015.12.004.

Carleton, R. N., Norton, M. A. P. J., & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of Anxiety Disorders*, 21(1), 105-117. https://doi.org/10.1016/j.janxdis.2006.03.014

Casidy, R., & Wymer, W. (2016). A risk worth taking: Perceived risk as moderator of satisfaction, loyalty, and willingnessto-pay premium price. *Journal of Retailing and Consumer Services*, 32, 189–197. https://doi.org/10.1016/j. jretconser.2016.06.014.

Chahal, H., & Devi, A. (2017). How perceived risk influences image and loyalty relationship in a tourist destination? an Indian perspective. *International Journal of Leisure and Tourism Marketing*, 5(2), 100. https://doi:10.1504/ijltm.2017.084618.

Chapman, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), Health behavior and health education: Theory, research, and practice (pp. 45–65). Jossey-Bass.

Chen, Y. Q., & Zhang, H. (2012). Investigation of sports tourism visitors risk perception and coping behavior. *Journal of Hebei Institute of Physical Education*, 26(3), 38–43.

Chew, E. Y. T., & Jahari, S. A. (2014). Destination image as a mediator between perceived risks and revisit intention: A case of post-disaster Japan. *Tourism Management*, 40, 382–393. doi:10.1016/j.tourman.2013.07.008.

Chien, P. M., Sharifpour, M., Ritchie, B. W., & Watson, B. (2017). Travelers' health risk perceptions and preventative behavior: A psychological approach. *Journal of Travel Research*, 56(6), 744–759. https://doi.org/10.1177/0047287516665479.

Crotts, J. C. (2004). The Effect of Cultural Distance on Overseas Travel Behaviors. *Journal of Travel Research*, 43(1), 83–88. https://doi.org/10.1177/0047287504265516.

Djeri, L., Armenski, T., Jovanovic, T., & Dragin, A. (2014). How income influences the choice of tourism destination? *Acta Oeconomica*, 64, 219–237. http://doi.org/10.1556/AOecon.64.2014.2.5.

Evans, G., & Durant, J. (1995). The Relationship between Knowledge and Attitudes in the Public Understanding of Science in Britain. *Public Understanding of Science*, 4(1), 57–74. https://doi.org/10.1088/0963-6625/4/1/004.

Floyd, D. L., Prentice-Dunn, S., & Rogers, R. W. (2000). A meta-analysis of research on protection motivation theory. *Journal of Applied Social Psychology*, 30(2), 407–429. https://doi.org/10.1111/j.1559-1816.2000.tb02323.x.

Floyd, M. F., Gibson, H., Pennington-Gray, L., & Thapa, B. (2004). The effect of risk perceptions on intentions to travel in the aftermath of September 11, 2001. *Journal of Travel & Tourism Marketing*, 15(2/3), 19–38. https://doi.org/10.1300/J073v15n02_02.

Gibson, H., & Yiannakis, A. (2002). Tourist roles: needs and the adult life course. *Annals of Tourism Research*, 2, 358–383. https://doi.org/10.1016/s0160-7383(01)00037-8.

Graburn, N. H. H. (1983). The anthropology of tourism. *Annals of Tourism Research*, 10(1), 9–33. http://doi.org/10.1016/0160-7383(83)90113-5.

Grupe, D. W., & Nitschke, J. B. (2013). Uncertainty and anticipation in anxiety: an integrated neurobiological and psychological perspective. *Nature Reviews*, 14(July), 488–501. https://doi.org/10.1038/nrn3524.

Hajibaba, H., Gretzel, U., Leisch, F., & Dolnicar, S. (2015). Crisis-resistant tourists. *Annals of Tourism Research*, 53, 46–60. https://doi.org/10.1016/j.annals.2015.04.001.

Hamer, D. H., and A. Connor Bradley (2004). Travel Health Knowledge, Attitudes and Practices among United States Travelers. *Journal of Travel Medicine*, 11 (1): 23-6. https://doi.org/10.2310/7060.2004.13577.

Hardisty, D. J. & Pfeffer, J. (2016). Intertemporal Uncertainty Avoidance: When the Future Is Uncertain, People Prefer the Present, and When the Present Is Uncertain, People Prefer the Future. *Management Science, 63*(2), 519-527. https://doi.org/10.1287/mnsc.2015.2349

Hasan, M. K., Ismail, A. R., & Islam, M. F. (2017). Tourist risk perceptions and revisit intention: A critical review of literature. *Cogent Business & Management*, 4(1). httpp://doi.org/10.1080/23311975.2017.1412874.

Hayes, B. C., & Tariq, V. N. (2000). Gender differences in scientific knowledge and attitudes toward science: a comparative study of four Anglo-American nations. *Public Understanding of Science*, 9(4), 433–447. https://doi:10.1088/0963-6625/9/4/306.

Henrich J, Heine SJ, Norenzayan A. (2010). The weirdest people in the world? *Behav Brain Sci., 33*(2-3):61-135. httpp://doi.org/10.1017/S0140525X0999152X.

Hofstede Insights. (n.d.). *Country Comparison. Brazil*. https://www.hofstede-insights.com/country-comparison/brazil/.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and Organizations: Software of the mind*. Mcgrawhill.

Huang, X., Dai, S., & Xu, H. (2020). Predicting tourists' health risk preventative behavior and travelling satisfaction in Tibet: Combining the theory of planned behavior and health belief model. *Tourism Management Perspectives*, 33, 100589. http://doi.org/10.1016/j.tmp.2019.100589.

Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly*, 11(1), 1–47. https://doi.org/10.1177/109019818401100101.

Jonas, A., Mansfeld, Y., Paz, S., & Potasman, I. (2010). Determinants of Health Risk Perception Among Low-risk-taking Tourists Traveling to Developing Countries. *Journal of Travel Research*, 50(1), 87–99. https://doi.org/10.1177/0047287509355323.

Kahneman, D., & Tversky, A. (1979). On the interpretation of intuitive probability: A reply to Jonathan Cohen. *Cognition*, 7(4), 409–411. https://doi.org/10.1016/0010-0277(79)90024-6.

Khan, M. J., Chelliah, S., & Ahmed, S. (2018). Intention to visit India among potential travellers: Role of travel motivation, perceived travel risks, and travel constraints. *Tourism and Hospitality Research*, 19(3), 351–367. http://doi.org/10.1177/1467358417751025.

Kluge, H.H. P. (2020, April 02). *Statement – Older people are at highest risk from COVID-19, but all must act to prevent community spread*. World Health Organization (WHO). https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/statements/statement-older-people-are-at-highest-risk-from-covid-19,-but-all-must-act-to-prevent-community-spread.

Kozak, M., Crotts, J. C., & Law, R. (2007). The impact of the perception of risk on international travellers. *International Journal of Tourism Research*, 9, 233–242. https://doi.org/10.1002/jtr.607.

Lehto, X., Douglas, A. C., & Park, J. (2008). Mediating the Effects of Natural Disasters on Travel Intention. *Journal of Travel & Tourism Marketing*, 23(2-4), 29–43. http://doi.org/10.1300/j073v23n02_03.

Li, J., Nguyen, T. H. H., & Coca-Stefaniak, J. A. (2020). Coronavirus impacts on post-pandemic planned travel behaviors. *Annals of Tourism Research*. In press. https://doi.org/10.1016/j.annals.2020.102964.

Li, W., Mengdie, X., & Cheng, L. (2018). Study on Behavioral Decision-making Based on Sunk Costs in Travel. *Proceedings of the 5th International Conference on Business, Economics and Management (BUSEM 2018).* Yinchuan, China. http://doi.org/10.25236/busem.2018.031.

Litvin, S.W., Crotts, J.C. and Hefner, F.L. (2004), Cross-cultural tourist behavior: a replication and extension involving Hofstede's uncertainty avoidance dimension. *Int. J. Tourism Res.*, *6*, 29-37. https://doi.org/10.1002/jtr.468

Liu, J., & Gao, J. (2008). Based tourism risk perception conceptual model – A case study of Shanghai residents. *Tourism Science*, 22(5), 37–43.

Liu, M. & Brock, J., Shi, G., Chu, R., & Tseng, T. (2013). Perceived benefits, perceived risk, and trust: Influences on consumers' group buying behavior. *Asia Pacific Journal of Marketing and Logistics*, 25(2), 225–248. https://doi.org/10.1108/13555851311314031.

Lopez-Velez, R., and J. M. Bayas (2007). Spanish Travelers to High-Risk Areas in the Tropics: Airport Survey of Travel Health Knowledge, Attitudes, and Practices in Vaccination and Malaria Prevention. *Journal of Travel Medicine*, 14 (5): 297-305. https://doi.org/10.1111/j.1708-8305.2007.00142.x.

Mazui, G., & Amato, F. (2020, March 19). *Brasil fecha fronteiras terrestres para entrada de estrangeiros vindos de países vizinhos da América do Sul.* Globo. https://g1.globo.com/politica/noticia/2020/03/19/brasil-fecha-fronteiras-com-paises-da-america-do-sul.ghtml.

McKercher, B., & Chon, K. (2004). The over-reaction to SARS and the collapse of Asian tourism. *Annals of Tourism Research,* 31(3), 716–719. https://doi.org/10.1016/j.annals.2003.11.002.

Ministério da Saúde [Ministry of Health]. (2020, June 07). *Portarias publicadas sobre COVID-19.* http://saude.gov.br/images/pdf/2020/June/07/Portarias-publicadas-sobre-COVID.pdf.

Mizrachi, I., & Fuchs, G. (2016). Should we cancel? An examination of risk handling in travel social media before visiting ebola-free destinations. *Journal of Hospitality and Tourism Management*, 28, 59–65. https://doi:10.1016/j.jhtm.2016.01.009.

Mohseni, S., Jayashree, S., Rezaei, S., Kasim, A., & Okumus, F. (2016). Attracting tourists to travel companies' websites: the structural relationship between website brand, personal value, shopping experience, perceived risk and purchase intention. *Current Issues in Tourism*, 21(6), 616–645. https://doi:10.1080/13683500.2016.1200539.

Money, R. B., & Crotts, J. C. (2003). The effect of uncertainty avoidance on information search, planning, and purchases of international travel vacations. *Tourism Management,* 24(2), 191–202. http://doi.org/10.1016/s0261-5177(02)00057-2.

Nascimento, L. (2020, May 7). *Não há regra geral sobre isolamento social, diz ministro da Saúde*. Agência Brasil. https://agenciabrasil.ebc.com.br/saude/noticia/2020-05/nao-ha-regra-geral-sobre-isolamento-social-diz-ministro-da-saude.

Nazneen, S., Hong, X., & Ud Din, N. (2020). COVID-19 Crises and Tourist Travel Risk Perceptions. *SSRN Electronic Journal*. http://doi.org/10.2139/ssrn.3592321.

Novelli, M., Gussing Burgess, L., Jones, A., & Ritchie, B. W. (2018). "No Ebola…still doomed" – The Ebola-induced tourism crisis. *Annals of Tourism Research*, 70, 76–87. http://doi.org/10.1016/j.annals.2018.03.006.

Neuburger, L., & Egger, R. (2020). Travel risk perception and travel behavior during the COVID-19 pandemic 2020: a case study of the DACH region. *Current Issues in Tourism*, 1–14. https://doi:10.1080/13683500.2020.1803807.

Pardo, R., & Calvo, F. (2004). The Cognitive Dimension of Public Perceptions of Science: Methodological Issues. *Public Understanding of Science*, 13(3), 203–227. https://doi:10.1177/0963662504045002.

Polas, M. R. H., Sahidullah, M., Hossain, M. I., Karim, A. M., Prabhakaran, S., & Khan, A. M. (2019). Antecedent and consequences of risk perception on tourist decision making towards the sustainable medical tourism development in Bangladesh. *Journal of Tourism Management Research*, 6(1), 93–108. http://doi.org/10.18488/journal.31.2019.61.93.108.

Provost, S., & Soto, J. C. (2002). Perception and knowledge about some infectious diseases among travelers from Québec, Canada. *Journal of Travel Medicine*, 9(4), 184–189. https://doi.org/10.2310/7060.2002.24550.

Qi, C. X., Gibson, H. J., & Zhang, J. J. (2009). Perceptions of risk and travel intentions: the case of China and the Beijing Olympic Games. *Journal of Sport & Tourism*, 14(1), 43–67. http://doi.org/10.1080/14775080902847439.

Quintal, V., & Polczynski, A. (2010). Factors influencing tourists' revisit intentions. *Asia Pacific Journal of Marketing and Logistics*, 22(4), 554–578. https://doi.org/10.1108/13555851011090565.

Reichel, A., Fuchs, G., & Uriely, N. (2007). Perceived risk and the non-institutionalized tourist role: The case of Israeli student ex-backpackers. *Journal of Travel Research*, 46(2), 217–226. https://doi.org/10.1177/0047287507299580.

Reisinger, Y., & Mavondo, F. (2005). Travel Anxiety and Intentions to Travel Internationally: Implications of Travel Risk Perception. *Journal of Travel Research*, 43(3), 212–225. http://doi.org/10.1177/0047287504272017.

Reza, J. M., & Samiei, N. 2012. Perceived risks in travelling to the Islamic Republic of Iran. *Journal of Islamic Marketing*, 3(2), 175–189. https://doi.org/10.1108/17590831211232573.

Rittichainuwat, B. N., & Chakraborty, G. (2009). Perceived travel risks regarding terrorism and disease: The case of Thailand. *Tourism Management*, 30(3), 410–418. https://doi:10.1016/j.tourman.2008.08.001.

Rittichainuwat, B., Nelson, R., & Rahmafitria, F. (2018). Applying the perceived probability of risk and bias toward optimism: Implications for travel decisions in the face of

natural disasters. *Tourism Management*, 66, 221–232. https://doi:10.1016/j.tourman.2017.09.013.

Roehl, W., & Fesenmaier, D. (1992). Risk perceptions and pleasure travel: An exploratory analysis. *Journal of Travel Research*, 30(4), 17–26. https://doi.org/10.1177/004728759203000403.

Sarmento, L. (2020, March 27). *Governo amplia fechamento de fronteiras aéreas para todas as nacionalidades.* Notícias Uol. https://noticias.uol.com.br/politica/ultimas-noticias/2020/03/27/governo-amplia-fechamento-de-fronteiras-aereas-para-todas-as-nacionalidades.htm?cmpid=copiaecola.

Sönmez, S., & Graefe, A. (1998a). Determining future travel behavior from past travel experience and perceptions of risk and safety. *Journal of Travel Research*, 37(2), 172–177. https://doi.org/10.1177/004728759803700209.

Sönmez, S.F., & Graefe, A. R. (1998b). Influence of terrorism risk on foreign tourism decisions. *Annals of Tourism Research*, 25(1), 112–144. https://doi.org/10.1016/S0160-7383(97)00072-8.

Tanovic, E., Gee, D. G., & Joormann, J. (2018). Intolerance of uncertainty: Neural and psychophysiological correlates of the perception of uncertainty as threatening. *Clinical Psychology Review*, (July 2017), 0–1. https://doi.org/10.1016/j.cpr.2018.01.001.

Taymoori, P., Molina, Y., & Roshani, D. (2014). Effects of a randomized controlled trial to increase repeat mammography screening in Iranian women. *Cancer Nursing*, 38(4), 288. https://doi.org/10.1097/ncc.0000000000000185.

The World Bank. (2020). *International tourism, expenditures (current US$).* https://data.worldbank.org/indicator/ST.INT.XPND.CD?end=2018&most_recent_value_desc=false&start=2018&view=map&year=2017.

Tsaur, S., Tzeng, G., & Wang, K. (1997). Evaluating tourist risks from fuzzy perspectives. *Annals of Tourism Research*, 24(4), 796–812. https://doi.org/10.1016/s0160-7383(97)00059-5.

Tversky, A., Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *J Risk Uncertainty, 5*, 297–323. https://doi.org/10.1007/BF00122574.

VOA News. (2020, June 24). *WHO Chief: Coronavirus Infections Could Reach 10M Next Week.* https://www.voanews.com/covid-19-pandemic/who-chief-coronavirus-infections-could-reach-10m-next-week.

Williams, A. M., & Baláž, V. (2013). Tourism, risk tolerance and competences: Travel organization and tourism hazards. *Tourism Management*, 35, 209–221. https://doi.org/10.1016/j.tourman.2012.07.006.

World Health Organization (WHO). (2020, April 05). *Coronavirus disease 2019 (COVID-19). Situation Report – 76.* https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200405-sitrep-76-covid-19.pdf?sfvrsn=6ecf0977_4.

World Tourism Organization (UNWTO). (2019, August 28). *International Tourism Highlights, 2019 Edition.* https://www.e-unwto.org/doi/epdf/10.18111/9789284421152.

World Tourism Organization (UNWTO). (2020a, May 07). *International tourist numbers could fall 60-80% in 2020, UNWTO reports*. https://www.unwto.org/news/covid-19-international-tourist-numbers-could-fall-60-80-in-2020.

World Tourism Organization (UNWTO). (2020b, Sep 15). *International tourist numbers down 65% in first half of 2020, UNWTO reports*. https://www.unwto.org/news/international-tourist-numbers-down-65-in-first-half-of-2020-unwto-reports.

Xie, C., Huang, Q., Lin, Z., & Chen, Y. (2020). Destination risk perception, image and satisfaction: The moderating effects of public opinion climate of risk. *Journal of Hospitality and Tourism Management*, 44, 122–130. https://doi:10.1016/j.jhtm.2020.03.007.

Zhu, H., & Deng, F. (2020). How to Influence Rural Tourism Intention by Risk Knowledge during COVID-19 Containment in China: Mediating Role of Risk Perception and Attitude. *International Journal of Environmental Research and Public Health*, 17(10), 3514.https://doi:10.3390/ijerph17103514.

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 October 2020 doi:10.20944/preprints202010.0432.v1

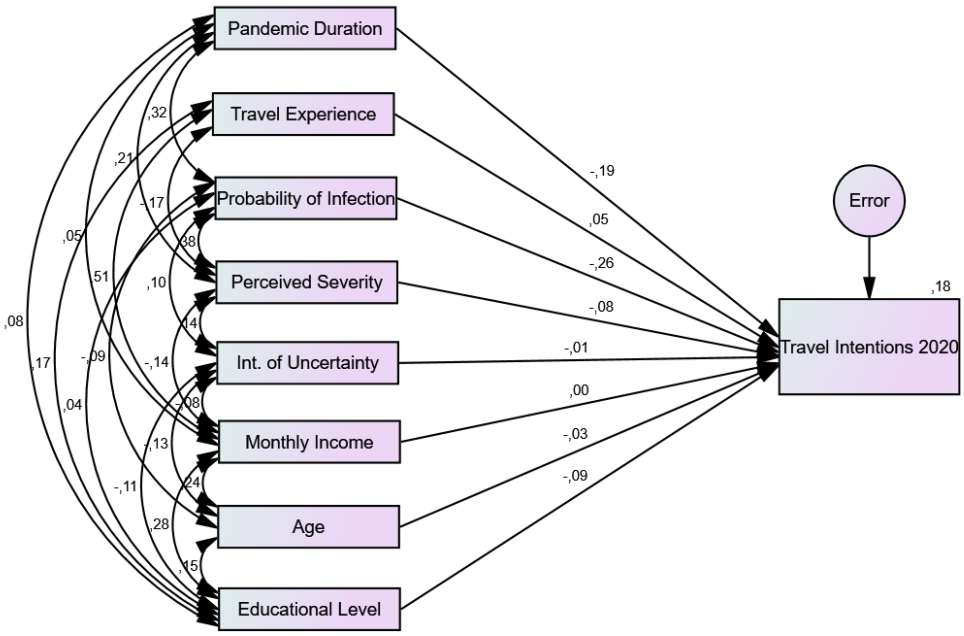
Table 1. Sociodemographic characteristics and travel experience of the sample (*n*=1,150).

		n	%
Gender	female	810	70.43
	male	331	28.78
	other	9	0.78
Age	18–25	148	12.86
	26–33	292	25.39
	34–41	293	25.47
	42–49	152	13.21
	50–57	151	13.13
	58–65	87	7.56
	66 and above	27	2.34
Education	incomplete high school	1	0.08
	completed high school	28	2.43
	incomplete university degree	142	12.34
	completed university degree	387	33.65
	postgraduate degree	591	51.39
Monthly income	up to 2 MW*	161	14.00
	2–4 MW	239	20.78
	4–10 MW	354	30.78
	10–20 MW	226	19.65
	above 20 MW	170	14.78
Domestic travel experience in the last 5 years	0 trips	47	4.08
	1-5 trips	267	23.21
	6-10 trips	236	20.52
	11-20 trips	168	14.60
	more than 20 trips	432	37.56
International travel experience in the last 5 years	0 trips	255	22.17
	1-5 trips	500	43.47
	6-10 trips	207	18.00
	11-20 trips	116	10.08
	more than 20 trips	72	6.26

* MW = minimum wage, 1 MW = 199.65 USD.

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 October 2020 doi:10.20944/preprints202010.0432.v1

Figure 1. Path Model on Predictors of Travel Intentions in 2020



Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 21 October 2020 doi:10.20944/preprints202010.0432.v1

Figure 2. Path Model on Predictors of Travel Intentions in 2021