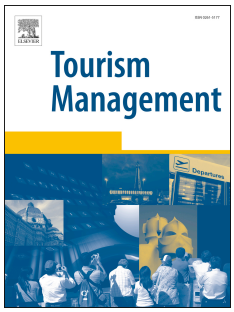
# Journal Pre-proof




COVID19: Holiday Intentions during a Pandemic

Nikolaos Pappas

PII: S0261-5177(21)00006-6

DOI: https://doi.org/10.1016/j.tourman.2021.104287

Reference: JTMA 104287

To appear in: *Tourism Management*

Received Date: 8 June 2020

Revised Date: 11 November 2020

Accepted Date: 7 January 2021

Please cite this article as: Pappas, N., COVID19: Holiday Intentions during a Pandemic, *Tourism Management*, https://doi.org/10.1016/j.tourman.2021.104287.

**Credit author statement**

I am declaring the sole authorship of the paper entitled “COVID19: Holiday Intentions during a Pandemic”.

# Title Page

**Manuscript Title:**

COVID19: Holiday Intentions during a Pandemic

Nikolaos Pappas

Associate Professor in Tourism, Hospitality & Events

Department of Hospitality, Events, Aviation and Tourism, University of Sunderland, U.K.

Sir Tom Cowie Campus, St. Peter's Way, SR6 0DD, Sunderland, U.K.

Telephone: +44 (0)191 515 2651

E-mail: nikolaos.pappas@sunderland.ac.uk

*Declarations of interest*: none

# COVID19: Holiday Intentions during a Pandemic

**Abstract**

The travel, tourism and hospitality industries have been the worst affected of the world's major economic sectors during the COVID19 pandemic, which has had a devastating effect on both destinations and organisations. Drawing from a sample (N=385) of adult permanent residents of Athens, Greece, the study examines the impact of COVID19 upon holiday intention. The chaordic systems are evaluated through the use of fuzzy-set Qualitative Comparative Analysis, whilst the study also used Necessary Condition Analysis for the calculation of the size effects of the examined conditions. The findings reveal two sufficient complex configurations leading to holiday intention: (i) holiday risks, and (ii) impact of COVID19. Based on the results, the article also offers a set of managerial implications. The contribution of the study is to both theoretical and methodological tourism domains.

*Keywords*: fuzzy-set Qualitative Comparative Analysis; Necessary Condition Analysis; Coronavirus; holiday intention; Greece

## 1. Introduction

And then, a pandemic came. A pneumonia of unknown cause was first detected in Wuhan, China, and it was reported to the World Health Organisation (WHO) Country Office in China on 31st December 2019 (WHO, 2020). Actually, the first case of a 55-year-old man from Hubei province was traced back to 17th November 2019, and the Chinese authorities identified at least 266 cases of Coronavirus (COVID19) before the end of the year (Ma, 2020). In Europe, COVID19 was first detected on 27th December 2019 in France (Roberts, 2020), four days earlier than the first case was reported by WHO. Since then, many more European countries have begun to report confirmed cases of COVID19, whilst in the United States the first confirmed case was reported on 19th January (Holshue et al., 2020). The outbreak was declared a Public Health Emergency of International Concern on 30th January, whilst the name 'COVID19' for the new Coronavirus disease was announced by WHO on 11th February (WHO, 2020). The scientific community has given the strain an interim name of 2019-nCoV, taking into account the year of discovery, its status as a 'novel' virus, and its family name (CoV) (Doyle, 2020). On 11th March, WHO declared the novel COVID19 outbreak a global pandemic (Cucinotta and Vanelli, 2020). Globally, by the end of the spring (31st May), more than 6.2 million people had been infected with COVID19, resulting in more than 370,000 fatalities, whilst approximately 2.8 million had recovered (John Hopkins, 2020).

The unprecedented COVID19 health crisis has brought the world to a standstill, and tourism has been the worst affected of all major economic sectors (UNWTO, 2020a). Concerning the aviation industry up until May 2020, estimates compared with figures for 2019 show an overall reduction in seats offered by airlines ranging from 32 to 59

percent, an overall reduction in passengers ranging from 1.8 million to 3.2 million, and an overall loss of gross operating revenues for airlines ranging from 240 to 420 billion USD (ICAO, 2020). This has led several airlines, including South African Airways, Avianca Holdings, Air Mauritius, Virgin Australia, Miami Air International, BRA, Flybe, RavnAir, Air Deccan, and Trans States Airlines, to declare themselves bankrupt (Madureira, 2020). In tourism for 2020 the estimated fall in international arrivals compared with 2019 figures is expected to reach 30 percent, with financial losses of 450 billion USD in international tourism receipts, almost a third of its global contribution (UNWTO, 2020b). Accordingly, 75 million jobs are expected to be lost in 2020 from the tourism sector (WTTC, 2020). All these aspects illustrate a deep crisis, placing tourism in its darkest hour.

Nevertheless, even if COVID19 has brought tourism to uncharted waters, our knowledge from previous crises (indicatively please read Cirstea [2014], Gurtner [2016], and Khazai, Mahdavian and Platt [2018]) shows that the industry can quickly recover and return to normality. A precondition of this is to regain the holiday intention of visitors. Tourism-related literature has examined a series of effects generated by disasters and crises. More specifically, several previous studies focused on crises and evaluated numerous issues such as business efficiency (Pearce II and Michael, 2006; Olthetena, Sougiannis, Travlos and Zarkos, 2013), productivity aspects (Mar-Molinero, Menéndez-Plans and Orgaz-Guerrero, 2017; Yépez, 2017), operational ability (Akrivos, Reklitis and Theodoroyiani, 2014; Epstein, Shapiro and Gómez, 2017) competitiveness (Cirstea, 2014; Pappas, 2015), innovation output (García-Pozo, Sanchez-Ollero, and Ons-Cappa, 2016; Naidoo, Ramseook-Munhurrun, and Seetaram, 2011), and enterprising cooperation (Okumus and Karamustafa, 2005;

Voltes-Dorta, Rodríguez-Deniz and Suau-Sanchez, 2017). However, the literature is predominantly silent upon the examination of holiday intentions during crises, let alone an unprecedented crisis like COVID19.

Holiday decision-making is characterised by high complexity levels, especially during periods of rapid change and uncertainty (Pappas, 2019). This study aims to examine the impact of COVID19 upon the holiday intention of the residents of Athens, people living in a country that has successfully managed to minimize the impact of the pandemic, but has been battling with an economic crisis for more than a decade. To do so, the research investigates the psychological impact of COVID19, the economic impact of the pandemic, the recession and COVID19, and the travel, destination and hospitality risks. The theoretical contribution of the study is a better understanding of the formulation of holiday intention during a COVID19 nationwide lockdown. Methodologically, its contribution is twofold. First, it examines the complexity of holiday intentions by using fuzzy-set Qualitative Comparative Analysis, a method that has only recently been employed in the travel and tourism domain. Second, it progresses to a complementary analysis of the size effects of the examined conditions by using Necessary Condition Analysis, a new method in the service sector.

## 2. The Greek case

On 26th February 2020 the first confirmed case of COVID19 appeared in Greece (APE-MPE, 2020). The Greek government had taken widespread measures (i.e. the closure of educational institutions and non-essential services) in order to prevent the spread of the virus in the very early stages (11th March), and it progressed to a complete lockdown and prohibition of movement on 23rd March (Menshouse, 2020).

These decisions were taken because of: the lessons leant from countries (e.g. Italy) that already had a substantial number of COVID19 fatalities; the shortage of intensive care units (less than 550 beds throughout the country) (Sarris, 2020); the extensive lack of medical and paramedical personnel; and the overall bad shape of the national health system (in the last decade 70,000 beds were lost and 359 hospital departments were closed) due to extensive budget cuts made over more than a decade to tackle the Greek economic crisis (Pigadas, 2020). These early stage measures led to a very low number of fatalities (less than 200) during the first wave (spring 2020) of COVID19.

Conversely, in terms of handling the socio-economic crisis generated by the pandemic, Greece showed one of the worst performances among EU member states. Indicatively, when most EU countries were subsidising 70 to 100 percent of lost salaries, Greece was only covering 50 percent, the level of financial support for the unemployed (800 €) was one of the lowest in the EU, and there was no protection of collective employment agreements or mechanism for avoidance of redundancies (Kopsini, 2020). It should also be noted that COVID19 had already devastated the Greek tourism and hospitality industry, a sector that contributes approximately 20 percent of the country's Gross Domestic Product (GDP) (Reuters, 2020). According to the IMF (2020), COVID19 will cause Greece to face a 10 percent loss in GDP during 2020, and a 5.1 percent loss in 2021.

To summarise, during the first wave of the pandemic Greece did not face a health crisis. Due to the effective risk management employed through widespread measures taken at a very early stage, Greece has avoided a crisis pandemic. On the other hand, the national economy, already weakened by a prolonged recession, was severely hit

by COVID19, whilst the measures taken to avoid the socio-economic effects of the pandemic were at best inadequate.

## 3. Chaos, complexity and chaordic systems

In recent decades, research has paid considerable attention to chaos control in business systems (Du, Huang and Sheng, 2009). The term 'chaos' refers to "a class of dynamic behaviour of deterministic systems characterized by sensitive dependence on initial conditions, diverging but constrained trajectories that imply unpredictability, and complex organisation or structure" (Schuldberg, 2011, p.183). Chaos theory was initially devised in 1963 (Lawrence, Feng and Huang, 2003), and has proved to be particularly useful when analysing complex systems (Mahmoudabadi, 2015). The theory of complexity has developed from the theory of chaos, and is mainly employed for studies researching aspects that include complex characteristics. Complexity theory concerns the systems that include several interacting agents, and even if it is difficult to make predictions, these are structured systems and allow improvement (Zahra and Ryan, 2007).

The concept of the 'chaordic-system' has emerged from the relationship which is strong between complexity and chaos (Fitzgerald and Van-Eijnatten, 2002). Hock (1995) suggested the term 'chaordic' term in order to emphasise the character of chaotically-ordered entities and complex systems. It is derived from the amalgamation of the words chaos and order, and creates the technical term 'chaord' (Van-Eijnatten, Putnik and Sluga, 2007). The main characteristic of a chaordic system is the dynamic and complex set of specific elemental connections that formulate a unified whole, whilst behaviourally it is at the same time unpredictable (chaos) even if it follows

specific patterns (order) (Olmedo, 2011). The main features of these systems are (Olmedo and Mateos, 2015): (i) the impossibility of long-term planning; (ii) their constant change, and their potential to form new complex structures in a spontaneous and endogenous manner; and (iii) their substantial influence based upon unexpectedly dramatic changes. As a result, a chaordic system has long memory (long-range correlational involvement and chaotic oscillations included in time series and in a non-stationery nature [Lahmiri, 2017]), self-organisation (systemically exhibiting emergent properties by internally organising behaviours/operations [Kauffman, Peterson, Samuelsson and Troein, 2003]), asymmetry (no statistical distribution, equivalence or equality with regard to operation, functions and behaviours [Waz and Waz, 2009]), resilience (the system is able to handle the conditions occurred, recover, and react accordingly [Mycek et al., 2017]), and it is sensitive when dealing with the initial conditions (the system has the ability to quickly diverge when the conditions slightly differ [Olmedo and Mateos, 2015]).

Within a business framework, chaos and complexity theories suggest that when organisations are at the edge of chaos, having to confront the opposing forces of stability and instability, they can disconnect from their previous operations and processes and, based on their ability to organise, accept the emergence of a new order. In this way, they can abruptly move from one state to another in a qualitative manner (Smith and Humphries, 2004). During crises and disasters, there is a dramatic increase in the complexity aspects of a business environment (Coskun and Ozceylan, 2011), hence, complexity theory is also linked to emergency management (Morakabati, 2016), creating a need for the examination of the formulated chaordic system (Pappas, 2018). At present, forecasting for a long term period of time is unlikely for chaotic

systems, and substantial change may occur when it is not expected; hence, "adaptiveness and flexibility are vital for the survival of organisations (Levy, 1994).

In travel and tourism, destinations and organisations need to gain the highest possible resilience when facing inevitable crises and disasters (Paraskevas, 2006). As Farrell and Twining-Ward (2004) suggest, tourism is a complex, uncertain, and unpredictable system, and the dynamics of tourism anarchy and its non-linear systems of complexity are essential in transitional periods. An analysis of current crisis management in the travel and tourism domain shows the need for a different approach to managing tourism crises due to the likely complex and chaotic nature of these events (Reddy, Boyd and Nica, 2020). Concerning tourists, they are characterised by complex psychology, and their perspectives are difficult to quantify, calibrate, and sometimes justify (Zhai, Zhong and Luo, 2019). Therefore, a complexity-based perspective when evaluating crises in the travel and tourism industries can provide a better understanding of tourism crisis management and planning (Reddy et al., 2020).

## 4. Study tenets

The services research literature uses the word 'tenet' to describe testable precepts able to identify some kind of order within chaordic systems (Pappas, 2018) and is connected with complexity theory (Papatheodorou and Pappas, 2017). The metrics of consistency and statistical hypotheses are not likely to be included when we employ outcome scores in order to evaluate the extent to which complex configurations are adequate (Wu, Yeh, Huan and Woodside, 2014). According to configurational theory, when considering factor arrangement, different outcomes may be generated from the same set of causal factors (Ordanini, Parasuraman and Rubera, 2014). This research

197 examines the impact of COVID19 upon the holiday intention of Athenian adult
198 permanent residents. Therefore, the presence or absence of a given condition (binary
199 sets) affecting the holiday intention of the respondents was examined. Along with the
200 socio-demographics of age and monthly income, the six examined attributes were: (i)
201 the psychological impact of COVID19; (ii) the economic impact of the pandemic; (iii)
202 the recession and COVID19; (iv) the travel risks; (v) the destination risks; and (vi) the
203 hospitality risks. Taking into consideration previous research by Olya and Altinay
204 (2016) and Pappas (2018) for the formulation of tenets, the study includes the
205 following six:
206
207 T1: A given attribute is able to determine different effects of COVID19 upon holiday
208 intention in accordance with its configuration/interaction with other attributes.
209 T2: Recipe principle: For the moment that two or more simple conditions formulate a
210 complex configuration, a condition of outcome is able to have a high consistent score.
211 T3: The interactions/configurations that are complex are able to influence the effect of
212 COVID19 upon holiday intention.
213 T4: Within different combinations the simple conditions of interactions/configurations
214 are able to affect in a positive or negative manner the effect of COVID19 upon
215 holiday intention.
216 T5: Equifinality principle: A sufficient effect of COVID19 upon holiday intention
217 cannot always be the result of a high score of outcome.
218 T6: When there are high Y scores, a recipe that is considered given for the effect of
219 COVID19 upon holiday intention is not relevant for all cases.
220
221 As Pappas (2018) suggests, the criteria confirming the above tenets are:

C1: All eight (two socio-demographics and six attributes) simple conditions must appear in at least one generated solution.

C2: A minimum of two out of eight simple conditions must be included in each complex configuration generated by the analysis.

C3: Each solution must provide a different pathway for holiday intention.

C4: Not even one of the examined simple conditions must be present in all generated sufficient complex configurations.

C5: fsQCA must provide at least two sufficient complex configurations for the effect of COVID19 upon holiday intention.

C6: No sufficient complex configuration must appear to have a coverage that can be applied in all cases.

## 5. Methods

### *5.1. Participants*

The study area was Athens, Greece. The research sample consisted of permanent adult residents of Athens recruited during April 2020. From 23$^{rd}$ March until 4$^{th}$ May the whole country (including Athens) was in strict lockdown due to COVID19, therefore the research was based on telephone interviews and used structured questionnaires. More specifically, the participants were randomly contacted using the starting landline telephone code of 210 followed by seven more digits. Most Athenian landline telephone numbers follow this pattern. In order to reduce research bias, list-wise deletion was used (the entire record was excluded from the analysis) for partially

246 completed interviews. When handling missing data, list-wise deletion is considered to
247 be the least problematic method (Allison, 2001).
248
249 *5.2. Sample*
250 The perspectives of the examined population were unknown, since the conditions
251 under which this research took place were unprecedented. For this reason, the most
252 conservative response format of 50/50 (50 percent of respondents have a positive
253 attitude and 50 percent a negative one) had to be assumed (Akis et al., 1996). The
254 cumulative probability (Z) for a sample larger than 20 people is 1.96 (Sekaran and
255 Bougie, 2013). Moreover, following Akis, Peristianis and Warner (1996), a minimum
256 95 percent level of confidence and a maximum five percent statistical error were
257 taken into consideration. Hence, the sample size was:
258

$$N = \frac{\mathrm{Z}^2(\text{hypothesis})}{S^2} \Rightarrow N = \frac{1.96^2(0.5)(0.5)}{0.05^2} \Rightarrow N = 384.16$$

259
260 According to Aaker and Day (1990) the sample size calculation is independent of the
261 overall size of the population. This is because the sample size determines the error, as
262 also shown in the formula above. Data gathering was complete when 385 useful
263 questionnaires had been collected.
264
265 *5.3. Measures*
266 The questionnaire consisted of 37 Likert scale statements (1: Strongly disagree; 5:
267 Strongly agree) and two socio-demographic (age; income) questions. None of the
268 statements was adopted from previous studies. The research also included two
269 exclusion questions, since the respondents had to be adult Athenian resident

permanently residing in the city for at least the last three years. Concerning the examined socio-demographics, the study by Pappas (2019) was followed for the age groupings 18-35, 36-50, and over 50. According to Trading Economics (2020), during 2019 the average monthly income in Greece was 1060 €. The research rounded the examination threshold to 1000 €.

The descriptive statistics and factor analysis were made through 'SPSS' software. The complex statements were evaluated using fuzzy-set Qualitative Comparative Analysis (fsQCA), by using 'fsQCA' software. The effect size of the examined antecedents was measured using Necessary Condition Analysis (NCA), by using 'R Studio' software. According to Longest and Vaisey (2008), fsQCA is a mixed method, since it combines the empirical testing of quantitative data and the analysis of specific cases through qualitative inductive reasoning. The research also takes into consideration the study by Woodside and Zhang (2013), and estimates the inclusion or not of a given condition (negated sets), indicating the absence of a condition with the symbol "~". Moreover, NCA was used in order to identify the necessary dataset conditions. According to Dul (2020), this method can be employed in a complementary manner in both parametric (i.e. regression) and non-parametric analysis (i.e. QCA). It is important to employ NCA because a necessary condition is considered a vital outcome factor, and without this condition the outcome will not occur (ERiM, 2020).

According to Skarmeas, Leonidou and Saridakis (2014), fsQCA can be employed only when a general asymmetry is present toward the relationships under evaluation, and the absolute correlated values are less than .6. Table 1 presents the correlation matrix of the examined coefficients, showing the existence of general asymmetry in

acceptable values (<.6). As Woodside (2013) suggests, these findings indicate that the examined causal conditions can lead to the same outcome. The study aims to investigate the effect of COVID19 on the holiday intentions of adult Athenian permanent residents, by estimating the complex antecedent conditions (causal recipes) of the following antecedents: (i) COVID19 psychological impact; (ii) COVID19 economic impact; (iii) recession and COVID19; (iv) travel risks; (v) destination risks; and (vi) hospitality risks. It also examines the effect of the socio-demographics of age and monthly income. Further, it employs NCA in a complementary analysis in order to estimate the size effect of the examined conditions and determine whether they can lead to the desired outcome.

Please insert **Table 1**

### *5.4. Algorithms*

The research calibration was achieved using 38 randomly selected individual cases. To examine the holiday intention of the respondents due to COVID19, 'f_hi', the fuzzy-sets used were: for age 'f_a'; for monthly income 'f_i'; for COVID19 psychological impact 'f_pci'; for COVID19 economic impact 'f_cei'; for recession and COVID19 'f_rc'; for travel risks 'f_tr'; for destination risks 'f_dr'; and for hospitality risks 'f_hr'.

## 6. Results

The socio-demographic characteristics of the sample are presented in Table 2. The largest age group was people between 36 and 50 years of age (48.3 percent). There was an almost equal distribution of respondents with regard to monthly income (a

slim majority of 51.7 percent of people had monthly incomes higher than 1000 €). Table 3 illustrates the descriptive statistics for the study, including the Likert scale statements for each examined condition.

Please insert **Table 2**

Please insert **Table 3**

As previously mentioned, all statements were formulated for the current research. Therefore, Exploratory Factor Analysis (EFA) was employed for the examination of the loadings (Table 4). The KMO test score was .772, higher than the minimum acceptable (>.6). Following Norman and Streiner (2008), all the rotated component matrix loadings that scored less than .4 were excluded from further analysis due to low commonality. Reliability analysis was conducted using Cronbach's alpha (A). The overall A was .739, whilst in all cases A was higher than .8 (the minimum acceptable value is .7 [Nunnally, 1978]).

Please insert **Table 4**

*6.1. Sufficient complex configurations*

The results generated three complex solutions able to lead to holiday intention (Table 5). The first sufficient configuration (f_a,~f_i,~f_pci,~f_cei,~f_rc,f_tr,f_dr,f_hr) includes the socio-demographic of age and has high membership scores concerning travel, destination, and hospitality risks. This complex statement appears to have the highest consistency (.84921) of all three solutions. The second complex solution

(f_a,f_i,f_pci,f_cei,~f_rc,~f_tr,~f_dr,~f_hr) includes both of the examined socio-demographics (age; monthly income), and has high scores in COVID19 psychological and economic impacts. The third solution (~f_a,f_i,f_pci,f_cei,f_rc,~f_tr,~f_dr,~f_hr) embeds the monthly income socio-demographic, and includes high membership scores for COVID19 psychological and economic impacts, and recession and COVID19. This sufficient complex configuration has the highest coverage (.46924) and lowest consistency (.80827).

Please insert **Table 5**

*6.2. Size effects*

The effect size (d) of the examined conditions was evaluated using NCA. As illustrated in Table 6, ce_fdh and cr_fdh are the ceiling zone in the middle parametric group where the ceiling zone is first displayed, and specify the minimum and maximum values of X and Y (Dul, 2020). As Dul (2020) indicates, most of the time ce_fdh produces a higher ceiling zone than cr_fdh. The results suggest that almost all the examined conditions (COVID19 psychological and economic impact; travel, destination and hospitality risks) show a small effect (0<d<.1). However, recession and COVID19 appears to have no effect (d=0), meaning that its inclusion in a generated solution cannot lead to the desired outcome. Therefore, the third solution generated by the fsQCA analysis (~f_a,f_i,f_ci,f_cei,f_rc,~f_tr,~f_dr,~f_hr) should be disregarded. Figure 1 visually presents the NCA results.

Please insert **Table 6**

Please insert **Figure 1**

## 7. Discussion

### *7.1. Confirmation of tenets*

Although NCA has excluded the third sufficient complex configuration generated by fsQCA, the evaluation of whether the tenets are confirmed should include all three solutions. This is because NCA was a complementary method used to evaluate the size effects of the examined conditions, and did not affect the generation, combination, and efficiency of complex configurations as they were generated by fsQCA.

Table 5 presents the coverage of the three sufficient complex configurations, which is high (.43556). Moreover, all eight of the simple conditions are present in at least one of the generated complex sufficient configurations, regardless of the fact that all solutions end up having the same outcome. This shows that each attribute has a contribution in a different way to the formulation of respondents' holiday intention related with the combination with the rest of the simple conditions. Therefore, the first tenet (T1) is confirmed. All three of the solutions include four attributes (more than two simple conditions are needed in order to create a complex configuration), and lead to the same outcome. Previous studies, such as Woodside (2014) and Pappas (2018), highlight this finding, and subsequently confirm the second tenet (T2). As previously mentioned, fsQCA in not based on variables but cases, and their solutions deal with (Ordanini et al., 2014): (i) an outcome concerning the combination of the examined antecedents; and (ii) the way these conditions are related within the specific

combination. Therefore, each sufficient complex configuration is generated through the complexity that specific simple antecedents interact, affecting the final outcome (Olya and Altinay, 2016). Thus the third tenet (T3) is confirmed. The inclusion or exclusion of specific attributes (contrarian case analysis) has shown that whether a simple condition is present or absent influences the effect upon the desired outcome, and in our case of COVID19 upon holiday intention. This actually confirms the fourth tenet (T4). As Woodside (2014, p.2499) suggests, "the occurrences of different paths usually do not occur with the same frequency among the set of paths". The principle of equifinality shows that multiple paths (in our case three) are able to lead to the same outcome. Hence, the findings confirm the fifth tenet (T5). Finally, Table 5 highlights that the coverage of the generated solutions varies from .41382 to .46924. According to Olya and Altinay (2016) and Pappas (2018), this finding indicates that no sufficient complex configuration applies in all cases. Each solution only partially covers the examined sample. On the other hand, the sum of solutions significantly covers the examined population of Athenians. This case relevance leads to confirmation of the last formulated tenet (T6).

*7.2. Complex solutions*

Of the three solutions generated using fsQCA, only two should be taken into consideration (the third was disregarded following the evaluation of size effects by NCA). These two sufficient configurations meet the aim of the study by showcasing the effect of COVID19 upon the Athenian residents with regards to their holidays. The first sufficient complex configuration reveals that holiday risks (travel; destination; hospitality) affect the related COVID19 holiday intention of respondents. More specifically, high scores appear for age (f_a), travel risks (f_tr), destination risks

(f_dr), and hospitality risks (f_hr). In this solution the socio-demographic of age seems to play an important role in the formulation of holiday intention. This can be explained by the fact that the older people are, the higher the proportion of fatalities from COVID19. More specifically, taking into consideration the USA, the country with most fatalities worldwide, amongst younger adults (aged 18 to 44) the share of deaths was lower than four percent, whilst for people over 75 years of age that share rocketed to almost 50 percent (Worldometer, 2020). As a result, older people are likely to be much more worried about the risks of taking a holiday. With regards to COVID19, these aspects highlight the importance of age when destinations and tourism-related enterprises target specific market segments, and employ their crisis management communications. One more aspect that needs to be taken into consideration is the high susceptibility of tourism to risks and crises. Several past studies (indicatively please read Hajibaba, Gretzel, Leisch and Dolnicar [2015] and Pappas and Papatheodorou [2017]) highlight the vulnerability of the industry to crises and disasters. This is because the sector is characterized by numerous interacting entities and activities critically vulnerable to crises (Cole, 2009) leading to an inherent non-linearity of the respective relationships, which prevents the effective coupling of causes and consequences (Olmedo and Mateos, 2015). As a result, the current sufficient complex configuration confirms findings from previous studies concerning the effect of risks upon holiday intention, provides evidence of the importance of holiday risks related to COVID19, and highlights the crucial age factor with respect to tourism during the current pandemic.

The second acceptable complex configuration concerns the impact of COVID19 upon holiday intention. More specifically, this solution scores highly for age (f_a), income

(f_i), psychological impact of COVID19 (f_pci), and the economic impact of COVID19 (f_cei). As a result, the study contributes by providing a connection of those aspects in terms of COVID19 impact to travel intention, providing the grounds to destinations and tourism-related enterprises to more effectively assess the business environment, and create sufficient pathways that can lead to the unforementioned travel intention. Once more, the socio-demographic of age in present, as in the first solution, this time alongside monthly income. The latter can be explained, since recent studies reveal that almost three quarters of Greeks (73 percent) perceive that the arrival of COVID19, the lockdown that followed, the devastation of the Greek tourist season that has already heavily affected tourism operations in the country, and a potential second outbreak from the autumn onwards have significantly affected their income (Financial Press, 2020). Monthly income is not something that affects only Greece, considering that a third of the population of the G7 (the seven wealthiest economies in the world) share the same income perspectives (Enikonomia.gr, 2020), whilst it is estimated that worldwide COVID19 will lead between 420 and 580 million people into poverty (UNU, 2020). However, the connection between monthly income and the simple condition of COVID19 economic impact (f_cei), and subsequently with the psychological impact of the pandemic (f_pci) is justified, since the statements of the latter evaluate a holistic perspective by discussing everyday life, people's way of life, hygiene, and fear and anxiety issues. Therefore, the current sufficient complex configuration provides evidence for the extent of the impact of COVID19 and the respondents' holiday intention, and reveals a reluctance to take holidays at least for the foreseeable future. Hence, it can be presumed that the return from COVID19 to tourism normality is not likely to be as fast as that following crises and disasters the sector has faced in the past.

The findings actually confirm the complex character of tourism decision making, especially during crisis periods, as also highlighted by previous studies (indicatively, please read Farrell and Twining-Ward, [2004], and Pappas [2019]). They also highlight the need for adopting a complexity-based perspective when evaluating crises in the travel and tourism industries (Reddy et al., 2020).

### *7.3. Managerial implications*

The study uses fsQCA to examine the complexity of the effect of COVID19 upon the holiday intention of adults living permanently in Athens. It further progresses to a complementary analysis of the size effect of the examined conditions using NCA. After disregarding one solution based upon the NCA results, the findings reveal two sufficient complex configurations focusing on: (i) holiday risks, and (ii) the impact of COVID19.

The chaordic systems affecting holiday intention as a result of COVID19 and identified by the research findings create a necessity for collaboration within the tourism industry that is more vital than ever. Safety comes first. Transportation companies (with special reference to the aviation industry) should create grounds for people to feel safe to travel again. These can include several initiatives such as the ad-hoc communication with customers concerning health and safety measures and advancements from travel companies, and relevant press releases focusing on the safety of the transport means (air; land; sea).This is always the case for travel, whether for business or leisure, but is even more relevant to holiday trips, since they are considered to be discretionary activities and are characterized by high elasticity

(Papatheodorou and Pappas, 2017). Safety also concerns destinations and hospitality firms. Social distancing is likely to last for a long time, since it is more than likely that there will not be a vaccine in 2021 (Lanese, 2020; Spinney, 2020). Therefore, it is crucial that destinations adopt all the necessary precautionary measures to ensure the safety of, as well as a feeling of safety amongst, their visitors. Destination initiatives can include crisis management communications addressed to both, visitors and tour operators in order to promote the undertaken actions for making a safer environment, the fast destination adaptability to the new reality, the strengthening of the health system and infrastructure in the destination and overall in the country in reference, the progress of confirmed COVID19 cases and related fatalities, the undertaken measures to protect the locals and the visitors, and the reshaped quality levels (with special focus on hygiene aspects) of the provided tourist products and services. The same applies to hospitality firms, whilst pressure for much lower occupancy rates (hence lower profitability) is substantial for both accommodation and service providers. Maybe this is one of the most appropriate times to also start talking about international collaborations and international uniformity of safety measures throughout the components of tourism in order to minimize potential confusion and the subsequent fear and anxiety levels of holidaymakers.

Another aspect is the extent to which people will be able to go on holiday. It is apparent from national and global forecasts, and supported by the findings of the current research, that a considerable number of people who were used to travelling for their holidays now consider it unlikely that they will be able to do so due to the widespread economic devastation COVID19 has created. This means that the value-for-money aspect is more crucial than at any other time. Travel, tourism and

hospitality firms, along with destinations, need to offer much higher quality to their products and services with a parallel reduction in prices. The subsequent reduction in profits can be handled with various ways involving the financial flexibility of enterprises, the restructuring of operations, and collaborative activities with other destinations and firms, even with those that might have been perceived as competitors in the past. COVID19 has violently reshaped the global tourism scenery, rapidly passing from 'overtourism' to 'undertourism', and especially affecting tourism-dependent economies (Johnston, 2020; Tarlow, 2020). Destinations and tourism-related enterprises do not have the 'luxury' they had in the past of depending for profitability on high volumes of tourists. Combined with the austerity in several countries (in our case Greece), it is more than certain that tourism has to face a substantial challenge to recover. Hence, international collaboration and support focusing on further economic development can strengthen tourism potential in national and international level. So as with COVID19 any collaboration cannot be fragmented in national borders.

Finally, the complex dynamics of the chaordic systems concerning tourism decision-making suggest that the intentions of people can be better examined using methods of non-parametric analysis (such as fsQCA) rather than linear assumptions. Several studies in the service sector (indicatively please read Ordanini et al. [2014], Pappas [2019], and Skarmeas et al. [2014]) have already highlighted that linear analysis is not able to encapsulate the full spectrum of this complexity. However, travel, tourism and hospitality research is still heavily dependent on the reductionist linear (Newtonian) approach. As it is showcased by the findings (also supported by previous studies mentioned above), in an academic context the use of non-parametric analysis in

545 travel, tourism and hospitality is able to provide a more holistic approach of the
546 aspects under examination. Therefore, shifting the research focus on the examination
547 of more complex aspects can further enhance our understanding of tourism-related
548 phenomena and conditions. Especially during crisis periods where complexity
549 substantially increases and several other crises may be triggered by the first (Pappas,
550 2018) (in our case the socio-economic crises initiated by the COVID19 health crisis),
551 the identification of multiple pathways that can lead to the same outcome is of the
552 utmost importance.
553

554 **8. Conclusions**

555 This study has focused on the chaordic effect of COVID19 on the holiday intention of
556 adult permanent residents of Athens, Greece. Theoretically, the research provides a
557 better comprehension of the complexity of holiday intention formulation during a
558 COVID19 pandemic. In the methodological domain, its contribution is based on the
559 examination of complexity through the use of fsQCA, a non-linear mixed method that
560 has only recently been employed in the field of tourism It also contributes by adopting
561 NCA as a complementary method for measuring the size effects of the examined
562 conditions, which is new (to the best of the author's knowledge) not only in tourism,
563 but generally in the service sector. Based on complex configurations, the findings
564 suggested two different pathways (holiday risks; impact of COVID19) that can lead to
565 the same outcome (holiday intention). The article also identifies several managerial
566 implications related to the research results.
567

568 Despite the theoretical and methodological contribution of the study, several
569 limitations need to be considered. First, this is the first time in the modern era that the

travel, tourism and hospitality industries have faced such an extensive and devastating crisis. Therefore, much more research is necessary for a full understanding of the unprecedented conditions the world has to face, and tourism has to confront. This is strengthened by the fact that COVID19 first appeared in mid-November 2019, and within a very short time has violently managed to change the way we think, act, and react. This aspect is also strengthened by the perspective that the travel intentions of tourists may differ due to various reasons such as the preference of domestic or international travel, due to state/government restrictions, the knowledge of language and culture, the perception of feeling more safe near home etc. The second limitation derives from the environment of the current research. The examined population was interviewed during a period of strict lockdown (April 2020), in the capital of a country (Athens, Greece) that has successfully managed to avoid (at least during the first wave of the pandemic) a health crisis, but is heavily dependent on tourism, and has battled for more than a decade with an economic crisis (the most severe on European soil [Pappas, 2018]) whilst COVID19 has further deepened its already devastating socio-economic effects. Therefore, any replication and generalization of the findings should be made with caution. Third, the research only evaluates the holiday intention of permanent adult residents of Athens. A comparison of the perspectives of these people, the destination authorities, and the travel and tourism stakeholders, alongside those of people who select Greece as their holiday destination, would provide a better understanding of the chaordic perspectives generated by the effect of COVID19. Finally, it might be useful to examine several other characteristics of the respondents such as their work environment and status, and job vulnerability. Such analysis could provide further information concerning their decision-making upon holiday intention.

Extreme times call for extreme measures. COVID19 can be considered not only as a major threat to the travel and tourism industry, but also as a great opportunity to change our way of thinking, and to quickly adapt to the new reality. Unfortunately, regardless of the globally devastating effect of the current pandemic, there are other imminent crises (i.e. climate change) that are likely to be much more destructive than COVID19. The lessons we learn could become pathways to our future, and the way we face the treats might determine our foreseeable survival and prosperity.

**References**

Aaker, D., & Day, G. (1990). *Marketing research*, New York: Wiley.

Akis, S., Peristianis. N., & Warner, J. (1996). Residents' attitudes to tourism development: the case of Cyprus. *Tourism Management, 17*(7), 481-494.

Akrivos, C., Reklitis, P., & Theodoroyiani, M. (2014). Tourism entrepreneurship and the adoption of sustainable resources. The case of Evritania prefecture. *Procedia Social and Behavioral Studies, 148*, 378-382.

Allison, P.D. (2001). *Missing data*. Thousand Oaks: Sage Publications.

APE-MPE (2020). *The first case of Coronavirus in Greece – positive sample in Thessaloniki*. Published 26 February, Available from: https://www.amna.gr/home/article/434170/To-proto-krousma-koronaiou-stin-Ellada (Accessed 23/5/2020) [in Greek]

Cirstea, S.D. (2014). Travel & tourism competitiveness: A study of world's top competitive countries. *Procedia Economics and Finance, 15,* 1273-1280.

Cole, S. (2009). A logistic tourism model: Resort cycles, globalization, and chaos. *Annals of Tourism Research, 36*(4), 689-714.

620 Coskun, E., and Ozceylan, D. (2011). Complexity in Emergency Management and
621 Disaster Response Information Systems (EMDRIS). Paper presented at the *8th*
622 *International ISCRAM Conference*, 8-11 May, Lisbon, Portugal.
623 Cucinotta, D., & Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic. *Acta*
624 *Biomed*, *91*(1), 157-160.
625 Doyle, L. (2020). Coronavirus named: What does COVID-19 stand for? Coronavirus
626 name meaning. *Express*, Published 15th May, Available from:
627 https://www.express.co.uk/life-style/health/1241302/Coronavirus-named-COVID-
628 19-meaning-WHO-coronavirus-latest-update (Accessed 23/5/2020)
629 Du, J., Huang, T., & Sheng, Z. (2009). Analysis of decision-making in economic
630 chaos control. *Nonlinear Analysis: Real World Applications*, *10*(4), 2493-2501.
631 Dul, J. (2020). *Conducting Necessary Condition Analysis.* Thousand Oaks: Sage
632 Publications.
633 Enikonomia.gr (2020). *Coronavirus: The income of one out of three citizens of G7*
634 *has been affected*. Published 17th April, Available from:
635 http://www.enikonomia.gr/international/233836,koronoios-pligma-sto-eisodima-
636 ypesti-1-stous-3-polites-tis-g7.html (Accessed 25/5/2020) [in Greek]
637 Epstein, B., Shapiro, A.F., & Gómez, A.G. (2017). Financial disruptions and the
638 cyclical upgrading of labor. *Review of Economic Dynamics*, *26*, 204-224.
639 ERiM (2020). *What is NCA*? Erasmus University Rotterdam. Available from:
640 https://www.erim.eur.nl/necessary-condition-analysis/about-nca/what-is-nca/
641 (Accessed 17/5/2020)
642 Financial Press (2020). *Gallop: Seven out of ten Greeks perceive negative income*
643 *impacts*. Published 1st April, Available from:

https://www.fpress.gr/diafora/story/63580/dimoskopisi-epta-stoys-deka-vlepoyn-epiptoseis-sto-eisodima (Accessed 24/5/2020) [in Greek]

Fitzgerald, L.A., & Van-Eijnatten, F.M. (2002). Reflections: chaos in organizational change. *Journal of Organizational Change Management, 15*(4), 402-411.

García-Pozo, A., Sanchez-Ollero, J.L., Ons-Cappa, M. (2016). ECO-innovation and economic crisis: a comparative analysis of environmental good practices and labour productivity in the Spanish hotel industry. *Journal of Cleaner Production, 138*, 131-138.

Gurtner, Y. (2016). Returning to paradise: Investigating issues of tourism crisis and disaster recovery on the island of Bali. *Journal of Hospitality and Tourism Management, 28*, 11-19.

Hajibaba, H., Gretzel, U., Leisch, F., & Dolnicar, S. (2015). Crisis-resistant tourists. *Annals of Tourism Research, 53*, 46-60.

Hock, D.W. (1996). The chaordic organization: Out of control and into order. *World Business Academy Perspectives, 9*(1), 5-18.

Holshue, M.L. et al. (2020). First Case of 2019 Novel Coronavirus in the United States. *The New England Journal of Medicine, 382*, 929-936.

ICAO (2020). *Effects of novel Coronavirus (COVID□19) on civil aviation: Economic impact analysis*. International Civil Aviation Organisation. Montreal: ICAO.

IMF (2020). *Policy responses to COVID-19*. International Monetary Fund, Available from: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#G (Accessed 23/5/2020)

John Hopkins (2020). *COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU).* Available from: https://coronavirus.jhu.edu/map.html (Accessed 1/6/2020)

669 Johnston, E. (2020). Outbreak turns Kyoto's overtourism into 'undertourism'. *The*
670 *Japan Times*, Published 14th March, Available from:
671 https://www.japantimes.co.jp/news/2020/03/14/national/outbreak-turns-kyotos-
672 overtourism-undertourism/#.Xspo9mhKhPY (Accessed 27/5/2020)
673 Kauffman, S., Peterson, C., Samuelsson, B., & Troein, C. (2003). Random Boolean
674 net-work models and the yeast transcriptional network. In: *Proceedings of the*
675 *National Academy of Sciences of the United States of America*, *100*(25), 14796–
676 14799.
677 Khazai, B., Mahdavian, F., & Platt, S. (2018). Tourism Recovery Scorecard (TOURS)
678 – Benchmarking and monitoring progress on disaster recovery in tourism
679 destinations. *International Journal of Disaster Risk Reduction*, *27*, 75-84.
680 Kopsini X. (2020). The support measures for employees in European countries and
681 the tip of the Greek government. *Efsyn*, Published 26th March, Available from:
682 https://www.candiadoc.gr/2020/03/26/ta-metra-stirixis-poy-
683 pairnoyn/#.XsjqpWhKhPY (Accessed 23/5/2020) [in Greek]
684 Lahmiri, S. (2017). On fractality and chaos in Moroccan family business stock returns
685 and volatility. *Physica A*, *473*, 29-39.
686 Lanese, N. (2020). When will a COVID-19 vaccine be ready? *Live Science*, Published
687 16th April, Available from: https://www.livescience.com/coronavirus-covid-19-
688 vaccine-timeline.html (Accessed 27/5/2020)
689 Lawrence, W.L., Feng, Y.L., & Huang, Y.C. (2003). Diagnosis of Freeway traffic
690 incidents with chaos theory. *Journal of the Eastern Asia Society for Transportation*
691 *Studies*, *5*, 2025-2038.
692 Levy, D. (1994). Chaos theory and strategy: Theory, application and managerial
693 implications. *Strategic Management Journal*, *15*(Summer), 167-178.

694 Longest, K., & Vaisey, S. (2008). Fuzzy: A Program for performing Qualitative
695 Comparative Analyses (QCA) in STATA. *The STATA Journal, 8*(1), 79-104.
696 Ma, J. (2020). Coronavirus: China's first confirmed Covid-19 case traced back to
697 November 17. *South China Morning Post*, Published 13 March, Available from:
698 https://www.scmp.com/news/china/society/article/3074991/coronavirus-chinas-
699 first-confirmed-covid-19-case-traced-back (Accessed 20/5/2020)
700 Madureira, C. (2020). COVID-19: List of airlines that didn't survive. *Sam Chui*
701 *Aviation & Travel*, published 12th May, Available from:
702 https://samchui.com/2020/05/12/covid-19-list-of-airlines-that-didnt-
703 survive/#.XslAfGhKhPY (Accessed 22/5/2020)
704 Mahmoudabadi, A. (2015). Developing a chaotic pattern of dynamic risk definition
705 for solving hazardous material routing-locating problem. *Journal of Loss*
706 *Prevention in the Process Industries, 37*, 1-10.
707 Mar-Molinero, C., Menéndez-Plans, C., & Orgaz-Guerrero, N. (2017). Has the 2008
708 financial crisis changed the factors determining the systematic risk of shares in the
709 "European Hospitality Industry"? (2003-2013). *Journal of Hospitality & Tourism*
710 *Management, 31*, 59-69.
711 Menshouse (2020). The reason that Greece has less cases than the country with the
712 best health system worldwide. Available from:
713 https://menshouse.gr/epikerotita/123645/o-logos-poy-i-ellada-echei-ligotera-
714 kroysmata-apo-ti-chora-me-to-kalytero-systima-ygeias-ston-kosmo (Accessed
715 23/5/2020) [in Greek]
716 Morakabati, Y., Page, S., & Fletcher, J. (2017). Emergency Management and Tourism
717 Stakeholder Responses to Crises: A Global Survey. *Journal of Travel Research*.
718 *56*(3), 299-316.

Mycek, P., Contreras, A., Le Maître, O., Sargsyan, K., Rizzi, F., Morris, K., Safta, C., Debusschere, B., & Knio, O. (2017). A resilient domain decomposition polynomial chaos solver for uncertain elliptic PDEs. *Computer Physics Communications, 216*, 18-34.

Naidoo, P., Ramseook-Munhurrun, P., & Seetaram, A.K. (2011). Marketing the hotel sector in economic crisis. Evidence from Mauricius. *Global Journal of Business Research, 5*(2), 1-12.

Norman, G., & Streiner, D. (2008). *Biostatistics: The bare essentials*. 3rd Eds., Hamilton: Decker.

Nunnally, J.C. (1978). *Psychometric theory*. 2nd Eds., New York: McGraw-Hill.

Okumus, F., & Karamustafa, K. (2005). Impact of an economic crisis: Evidence from Turkey. *Annals of Tourism Research, 32*(4), 942-961.

Olmedo, E. (2011). Is there chaos in the Spanish labour market? *Chaos, Solitons and Fractals, 44*(12), 1045-1053.

Olthetena, E., Sougiannis, T., Travlos, N., & Zarkos, S. (2013). Greece in the Eurozone: Lessons from a decade of experience. *The Quarterly Review of Economics and Finance, 53*, 317-335.

Olya, H.G., & Altinay, L. (2016). Asymmetric modeling of intention to purchase tourism weather insurance and loyalty. *Journal of Business Research, 69*(8), 2791-2800.

Ordanini, A., Parasuraman, A., & Rubera, G. (2014). When the recipe is more important than the ingredients: A Qualitative Comparative Analysis (QCA) of service innovation configurations. *Journal of Service Research, 17*(2), 134-149.

Papatheodorou, A. & Pappas, N. (2017). Economic recession job vulnerability and tourism decision-making: A Qualitative Comparative Analysis. *Journal of Travel Research, 56*(5), 663-677.

Pappas, N. & Papatheodorou, A. (2017). Tourism and the refugee crisis in Greece: Perceptions and decision-making of accommodation providers. *Tourism Management, 63*, 31-41.

Pappas, N. (2015). Achieving competitiveness in Greek accommodation establishments during recession. *International Journal of Tourism Research, 17*(4), 375-387.

Pappas, N. (2018). Hotel decision-making during multiple crises: A chaordic perspective. *Tourism Management, 68*, 450-464.

Pappas, N. (2019). UK outbound travel and Brexit complexity. *Tourism Management, 79*, 12-22.

Paraskevas, A. (2006). Crisis management or crisis response system? A complexity science approach to organizational crises. *Management Decision, 44*(7), 892-907.

Pearce II, J.A., & Michael, S.C. (2006). Strategies to prevent economic recessions from causing business failure. *Business Horizons, 49*(3), 201-209.

Pigadas, A. (2020). A health system with porcelain legs. *Efsyn*, Published 11th April, Avaliable from: https://www.efsyn.gr/nisides/238921_ena-systima-ygeias-me-pilina-podia (Accessed 23/5/2020) [in Greek]

Reddy, M.V., Boyd, S.W., & Nica, M. (2020). Towards a post-conflict tourism recovery framework. *Annals of Tourism Research*, Article in press.

Reuters (2020). *Coronavirus tourism strike threatens the Greek achievements of the last 10 years*. Published 11th May, Available from: https://www.capital.gr/oikonomia/3452406/reuters-to-pligma-tou-koronoiou-ston-

tourismo-apeilei-kopous-kai-epiteugmata-10-eton-gia-tin-ellada (Accessed 23/5/2020) [in Greek]

Roberts, M. (2020). Coronavirus: France's first known case 'was in December'. *BBC*, Published 5th May, Available from: https://www.bbc.com/news/world-europe-52526554 (Accessed 21/5/2020)

Sarris, G. (2020). What needs to be done for avoiding the collapse of the health system due to Coronavirus. *Newsbeast*, Published 21st March, Available from: https://www.newsbeast.gr/weekend/arthro/6119015/ti-prepei-na-ginei-oste-na-min-katarreysei-to-systima-ygeias-stin-ellada-logo-koronoioy (Accessed 23/5/2020) [in Greek]

Schuldberg, D. (2011). Chaos theory and creativity. *Encyclopedia of Creativity*, 183-191.

Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill building approach*. Chennai: Wiley and Sons.

Skarmeas, D., Leonidou, C.N., & Saridakis, C. (2014). Examining the role of CSR skepticism using fuzzy-set qualitative comparative analysis. *Journal of Business Research, 67*, 1796-1805.

Smith, A. & Humphries, C. (2004). Complexity theory as a practical management tool: A critical evaluation. *Organization Management Journal*, *1*(2), 91-106.

Spinney, L. (2020). Coronavirus vaccine: when will we have one? *The Guardian*, Published 19th April, Available from: https://www.theguardian.com/world/2020/apr/19/coronavirus-vaccine-when-will-we-have-one (Accessed 27/5/2020)

Tarlow, P.E. (2020). *Working in the Travel Industry during Coronavirus: Turning Overtourism to Undertourism*. Published 16th March, Available from:

https://www.eturbonews.com/567224/working-in-the-travel-industry-during-coronavirus-turning-overtourism-to-undertourism/ (Accessed 27/5/2020)

Trading Economics (2020). Greece average monthly salary. Available from: https://tradingeconomics.com/greece/wages (Accessed 23/5/2020)

UNU (2020). *Estimates of the impact of COVID-19 on global poverty*. United Nations University, Available from: https://www.wider.unu.edu/publication/estimates-impact-covid-19-global-poverty (Accessed 25/5/2020).

UNWTO (2020a). COVID19: *Putting people first*. United Nations World Tourism Organisation, Available from: https://www.unwto.org/tourism-covid-19 (Accessed 24/5/2020)

UNWTO (2020b). *Impact assessment of the COVID-19 outbreak on international tourism*. Available from: https://www.unwto.org/impact-assessment-of-the-covid-19-outbreak-on-international-tourism (Accessed 24/5/2020)

Van-Eijnatten, F.M., Putnik, G.T., & Sluga, A. (2007). Chaordic systems thinking for novelty in contemporary manufacturing. *CIRP Annals - Manufacturing Technology*, *56*(1), 447-450.

Voltes-Dorta, A., Rodríguez-Deniz, H., & Suau-Sanchez, P. (2017). Passenger recovery after an airport closure at tourist destinations: A case study of Palma de Mallorca airport. *Tourism Management*, *59*, 449-466.

Waz, P., & Waz, D.B. (2009). Asymmetry coefficients as indicators of chaos. *Acta Physica Polonica A*, *116*(6), 987-991.

WHO (2020). *Rolling updates on coronavirus disease (COVID-19)*. World Health Organisation. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen (Accessed 20/5/2020)

816 Woodside, A.G. (2013). Moving beyond multiple regression analysis to algorithms:
817 Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in
818 data analysis and crafting theory. *Journal of Business Research*, *66*(4), 463-472.
819 Woodside, A.G. (2014). Embrace•perform•model: Complexity theory, contrarian case
820 analysis, and multiple realities. *Journal of Business Research*, *67*, 2495-2503.
821 Woodside, A.G., & Zhang, M. 2013. Cultural diversity and marketing transactions:
822 Are market integration, large community size, and world religions necessary for
823 fairness in ephemeral exchanges? *Psychology and Marketing*, *30*(3), 263-276.
824 Worldometer (2020). Age, sex, existing conditions of COVID-19 cases and deaths.
825 Available from: https://www.worldometers.info/coronavirus/coronavirus-age-sex-
826 demographics/ (Accessed 24/5/2020)
827 WTTC (2020). *Economic impact reports*. World Travel and Tourism Council.
828 Available from: https://wttc.org/Research/Economic-Impact (Accessed 22/5/2020)
829 Wu, P.L., Yeh, S.S., Huan, T.C., & Woodside, A.G. (2014). Applying complexity
830 theory to deepen service dominant logic: Configural analysis of customer
831 experience-and-outcome assessments of professional services for personal
832 transformations. *Journal of Business Research*, *67*(8), 1647-1670.
833 Yépez, C.A. (2017). Financial intermediation, consumption dynamics, and business
834 cycles. *Economic Modelling*, *60*, 231-243.
835 Zahra, A., & Ryan, C. (2007). From chaos to cohesion—Complexity in tourism
836 structures: An analysis of New Zealand's regional tourism organizations. *Tourism*
837 *Management*, *28*(3), 854-862.
838 Zhai, X., Zhong, D., & Luo, Q. (2019). Turn it around in crisis communication: An
839 ABM approach. *Annals of Tourism Research, 79,* Article in press.
840

841 **Table 1:** Correlation matrix

842

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| **1** | Psychol. Impact | 1 | | | | | | |
| **2** | Economic Impact | .018 | 1 | | | | | |
| **3** | Recession | -.093 | .044 | 1 | | | | |
| **4** | Travel Risks | .030 | -.054 | .027 | 1 | | | |
| **5** | Destination Risks | -.029 | -.142 | -.118 | .100 | 1 | | |
| **6** | Hospitality Risks | .019 | -.024 | .000 | -.079 | .070 | 1 | |
| **7** | Holiday Intention | .084 | .059 | -.060 | .066 | .059 | .013 | 1 |

843

844

845 **Table 2:** Profile of the respondents

846

| | N | % |
|---|---|---|
| *Age* | | |
| 18-35 | 126 | 32.7 |
| 36-50 | 186 | 48.3 |
| >50 | 73 | 19.0 |
| *Income* | | |
| ≤1000 € | 186 | 48.3 |
| >1000 € | 199 | 51.7 |
| *Total* | *385* | *100* |

847

848

**Table 3:** Descriptive statistics

| | Statements | Means | SD | Age | | | Income | |
|---|---|---|---|---|---|---|---|---|
| | | | | *18-35* | *36-50* | *>50* | *≤1000* | *>1000* |
| | *COVID-19 Psychological Impact* | | | | | | | |
| PCI1 | COVID-19 has impacted my everyday life. | 4.23 | .797 | 4.17 | 4.40 | 3.88 | 4.39 | 4.08 |
| PCI2 | COVID-19 has changed my hygiene standards. | 4.43 | .751 | 4.29 | 4.45 | 4.64 | 4.62 | 4.26 |
| PCI3 | COVID-19 has made me fearful. | 4.33 | .792 | 3.96 | 4.47 | 4.59 | 4.46 | 4.20 |
| PCI4 | COVID-19 has increased my anxiety level. | 4.12 | .859 | 3.76 | 4.24 | 4.44 | 4.18 | 4.07 |
| PCI5 | COVID-19 has made me reconsider my way of life. | 3.94 | 1.120 | 3.62 | 4.11 | 4.07 | 3.97 | 3.91 |
| | *COVID-19 Economic Impact* | | | | | | | |
| CEI1 | COVID-19 has changed my consumption patterns. | 3.59 | .937 | 3.42 | 3.68 | 3.66 | 3.62 | 3.56 |
| CEI2 | COVID-19 has increased my job vulnerability. | 3.61 | 1.226 | 3.67 | 3.98 | 2.55 | 3.67 | 3.55 |
| CEI3 | COVID-19 has substantially affected my income. | 3.61 | 1.299 | 3.44 | 4.16 | 2.51 | 3.68 | 3.55 |
| CEI4 | COVID-19 will substantially affect my income during 2020. | 3.77 | 1.284 | 3.66 | 4.28 | 2.67 | 3.84 | 3.71 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CEI5 | COVID-19 will substantially affect my income in the future. | 3.83 | 1.189 | 3.60 | 4.25 | 3.15 | 3.96 | 3.71 |
| | *Recession and COVID-19* | | | | | | | |
| RC1 | COVID-19 will deepen the current recession. | 4.42 | .612 | 4.57 | 4.39 | 4.22 | 4.52 | 4.33 |
| RC2 | COVID-19 has affected me more than the economic crisis. | 2.38 | .824 | 2.38 | 2.46 | 2.19 | 2.23 | 2.53 |
| RC3 | COVID-19 has changed my consumption patterns more than the economic crisis has. | 2.66 | .968 | 2.76 | 2.62 | 2.60 | 2.58 | 2.75 |
| RC4 | COVID-19 has affected my job more than the economic crisis has. | 2.53 | 1.041 | 2.64 | 2.52 | 2.36 | 2.39 | 2.65 |
| RC5 | Combined with the current recession, COVID-19 will be devastating for my way of life. | 2.65 | 1.001 | 2.68 | 2.76 | 2.33 | 2.64 | 2.67 |
| RC6 | Combined with the current recession, COVID-19 will have devastating effects on the national economy. | 4.21 | .793 | 4.37 | 4.18 | 3.99 | 4.25 | 4.17 |
| | *Travel Risks* | | | | | | | |
| TR1 | I am afraid to travel due to COVID-19. | 3.68 | .833 | 3.46 | 3.71 | 3.96 | 3.65 | 3.70 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TR2 | I believe that mass transport is not safe due to COVID-19. | 3.89 | .915 | 3.72 | 3.88 | 4.21 | 3.89 | 3.89 |
| TR3 | I am reluctant to travel by air due to COVID-19. | 3.99 | .921 | 3.89 | 3.95 | 4.29 | 4.02 | 3.97 |
| TR4 | I am reluctant to travel by boat due to COVID-19. | 3.93 | .933 | 3.77 | 3.85 | 4.41 | 3.93 | 3.93 |
| TR5 | I am reluctant to travel by land-based means of mass transport (i.e. train; bus) due to COVID-19. | 3.98 | .873 | 3.83 | 3.91 | 4.42 | 3.95 | 4.02 |
| | *Destination Risks* | | | | | | | |
| DR1 | Considering COVID-19, I believe that Greece is a safe destination. | 3.40 | .797 | 3.23 | 3.44 | 3.59 | 3.37 | 3.42 |
| DR2 | Considering COVID-19, I believe that going for a holiday somewhere in Greece is safer than travelling abroad. | 3.57 | .896 | 3.41 | 3.55 | 3.92 | 3.54 | 3.61 |
| DR3 | COVID-19 will markedly affect my destination selection for holidays during 2020. | 3.67 | 8.28 | 3.56 | 3.62 | 4.00 | 3.65 | 3.69 |
| DR4 | COVID-19 will markedly affect my destination selection for holidays in future years. | 3.20 | .912 | 3.05 | 3.24 | 3.36 | 3.16 | 3.24 |
| DR5 | COVID-19 will negatively affect the quality of destination | 3.59 | .917 | 3.47 | 3.61 | 3.77 | 3.58 | 3.61 |

products and services.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Hospitality Risks* | | | | | | | |
| HR1 | I would be reluctant to sit and eat in a restaurant due to COVID-19. | 3.61 | .865 | 3.56 | 3.57 | 3.82 | 3.57 | 3.65 |
| HR2 | I would be reluctant to sit in a café/bar due to COVID-19. | 3.49 | .966 | 3.43 | 3.44 | 3.74 | 3.44 | 3.54 |
| HR3 | Due to COVID-19, during my holidays I would prefer to prepare my own food (meals; drinks etc.) | 3.85 | .944 | 3.80 | 3.82 | 3.99 | 3.81 | 3.88 |
| HR4 | I would be afraid to stay in accommodation I had paid for due to COVID-19. | 4.02 | .963 | 3.95 | 4.01 | 4.16 | 4.01 | 4.03 |
| HR5 | Due to COVID-19, during my holidays I would prefer to stay in a house that I own. | 3.65 | 1.012 | 3.59 | 3.61 | 3.88 | 3.62 | 3.68 |
| HR6 | Due to COVID-19, during my holidays I would prefer to stay in a house that my friends/relatives own. | 3.47 | 1.028 | 3.45 | 3.46 | 3.52 | 3.42 | 3.51 |
| | *Holiday Intention* | | | | | | | |
| HI1 | COVID-19 will affect my decision whether to go for | 3.25 | .913 | 2.79 | 3.42 | 3.60 | 3.25 | 3.25 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | holidays in 2020. | | | | | | | |
| HI2 | COVID-19 will affect my decision whether to go for holidays in future years. | 3.06 | .978 | 2.67 | 3.22 | 3.36 | 3.06 | 3.07 |
| HI3 | Due to COVID-19 I would prefer to go for holidays somewhere in Greece rather than abroad. | 3.53 | 1.070 | 3.23 | 3.65 | 3.74 | 3.55 | 3.51 |
| HI4 | COVID-19 has had a greater impact upon my holiday intention than the recession. | 3.30 | .897 | 2.99 | 3.47 | 3.38 | 3.36 | 3.24 |
| HI5 | I intend to go for holidays during 2020. | 3.70 | 1.039 | 3.38 | 3.86 | 3.86 | 3.65 | 3.76 |

**Table 4:** Rotated matrix loadings and Cronbach's A

| | **Loadings** | **Cronbach's A** |
|---|---|---|
| *COVID-19 Psychol. Impact* | | .850 |
| PCI1 | .831 | |
| PCI2 | .823 | |
| PCI3 | .904 | |
| PCI4 | .801 | |
| PCI5 | .654 | |
| *COVID-19 Economic Impact* | | .902 |
| CEI1 | .538 | |
| CEI2 | .886 | |
| CEI3 | .944 | |
| CEI4 | .933 | |
| CEI5 | .852 | |
| *Recession and COVID-19* | | .863 |
| RC1 | LC | |
| RC2 | .866 | |
| RC3 | .909 | |
| RC4 | .864 | |
| RC5 | .727 | |
| RC6 | LC | |
| *Travel Risks* | | .947 |
| TR1 | .815 | |
| TR2 | .933 | |
| TR3 | .950 | |

| | | |
|---|---|---|
| TR4 | .937 | |
| TR5 | .888 | |
| *Destination Risks* | | .913 |
| DR1 | .934 | |
| DR2 | .908 | |
| DR3 | .832 | |
| DR4 | .806 | |
| DR5 | .807 | |
| *Hospitality Risks* | | .918 |
| HR1 | .903 | |
| HR2 | .908 | |
| HR3 | .845 | |
| HR4 | .770 | |
| HR5 | .876 | |
| HR6 | .754 | |
| *Holiday Intention* | | .913 |
| HI1 | .935 | |
| HI2 | .836 | |
| HI3 | .879 | |
| HI4 | .850 | |
| HI5 | .805 | |

LC: Eliminated due to low commonality (<.4)

**Table 5:** Complex solutions for COVID-19

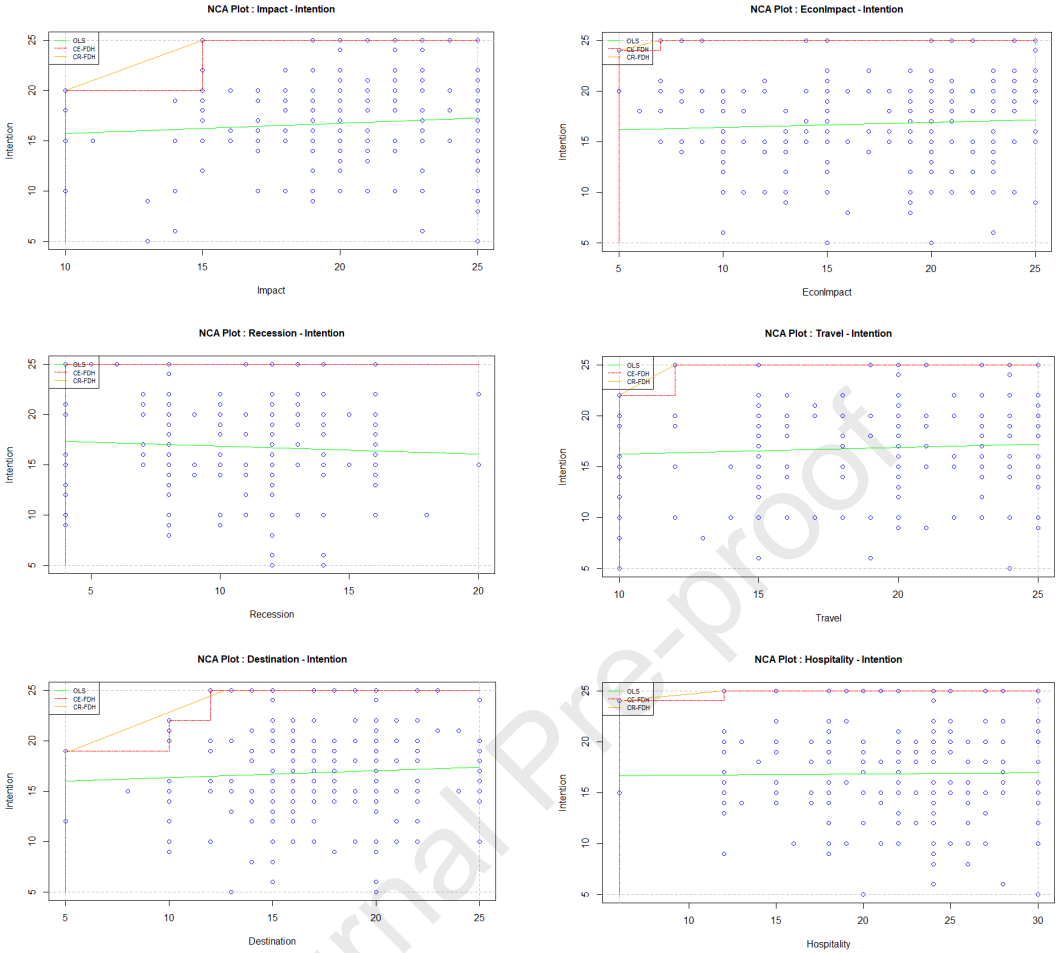
| Complex Solution | Raw Coverage | Unique Coverage | Consistency |
|---|---|---|---|
| Model: f_hi=f(f_a,f_i,f_pci,f_cei,f_rc,f_tr,f_dr,f_hr) | | | |
| f_a,~f_i,~f_pci,~f_cei,~f_rc,f_tr,f_dr,f_hr | .42863 | .12278 | .84921 |
| f_a,f_i,f_pci,f_cei,~f_rc,~f_tr,~f_dr,~f_hr | .41382 | .11730 | .82084 |
| ~f_a,f_i,f_pci,f_cei,f_rc,~f_tr,~f_dr,~f_hr | .46924 | .13012 | .80827 |
| *Solution Coverage*: .43556 | *Solution Consistency*: .82375 | | |

| | | |
|---|---|---|
| f_a: Age | f_i: income | f_tr: Travel Risks |
| f_pci: COVID-19 Psychological Impact | f_cei: COVID-19 Economic Impact | f_rc: Recession and COVID-19 |
| f_dr: Destination Risks | f_hr: Hospitality Risks | f_hi: Holiday Intention |

**Table 6:** Size effect

| | | ce_fdh | cr_fdh |
|---|---|---|---|
| 1 | Psychological Impact – Intention | .083 | .042 |
| 2 | Economic Impact – Intention | .005 | .002 |
| 3 | Recession – Intention | .000 | .000 |
| 4 | Travel Risks – Intention | .020 | .010 |
| 5 | Destination Risks – Intention | .090 | .060 |
| 6 | Hospitality Risks – Intention | .012 | .006 |

**Figure 1:** NCA plots



**Author photo**

**Biographical note**

Nikolaos Pappas is Associate Professor in Tourism, Hospitality and Events, and the Director of the Centre for Research in Tourism Excellence (CERTE) at the University of Sunderland, UK. He holds a doctorate (PhD) in tourism development and a post-doctorate (PDoc) in risk and crisis management. He has worked more than 20 years in the tourism and hospitality industry, and since 2001 he is an academic in Greek and UK universities. He has numerous publications in esteemed scientific journals and conferences, and acts as a reviewer in several journals. His research interests include crisis management communications, and tourism and hospitality management.

**Impact Statement**

This study examines the impact of COVID19 upon the holiday intention of the residents of Athens, people living in a country that has successfully managed to minimize the impact of the pandemic, but has been battling with an economic crisis for more than a decade. The theoretical contribution of the study is a better understanding of the formulation of holiday intention during a COVID19 nationwide lockdown. Methodologically, its contribution is twofold. First, it examines the complexity of holiday intentions by using fuzzy-set Qualitative Comparative Analysis, a method that has only recently been employed in the travel and tourism domain. Second, it progresses to a complementary analysis of the size effects of the examined conditions by using Necessary Condition Analysis, a new method (to the best of the author's knowledge) in tourism. The article also identifies and discusses several managerial implications related to the research results.