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COVID-19-induced negative emotions and the impacts on personal values and travel behaviors: A threat appraisal perspective

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A R T I C L E   I N F O

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A B S T R A C T

Based on the Protection Motivation Theory (PMT), this paper aims to examine the role of negative emotions and their impacts on personal value orientations and protective travel behaviors during COVID-19. Data were collected among Chinese Generation Z who have shared the cataclysmic experience of COVID-19 in their formative years. A multimethod approach was adopted with focus group discussions to explore prominent changes in personal values during COVID-19, followed by a quantitative study. The serial mediation analysis supported the sequential internalization of negative emotions and personal values induced from COVID-19 threat appraisals, which in combination, imposed indirect effects on travel avoidance behavior. An extended model suggested that fear is positively related to the values of altruism and hedonism, while mild negative emotions are associated with target orientation. Altruism was found to enhance travel avoidance propensity while target orientation attenuated such propensity. The findings shed light for both academia and the industry.

1. Introduction

COVID-19, being the pandemic of the century, has imposed a significant threat to the world and changed human lives permanently. Tourism industry has suffered severe disruptions due to national lockdowns, travel bans, and quarantine policies to curb the transmission of disease (Bhati, Mohammadi, Agarwal, Kamble, & Donough-Tan, 2021; Gössling, Scott, & Hall, 2020). The exceptional circumstance has amplified fear, anxiety, and other negative emotions (Fischer, Bortolini, Pilat, Porto, & Moll, 2021; Kim, Yang, Min, & White, 2021; Mahmud, Talukder, & Rahman, 2021), leaving the population splintered with dreadful memories, and irrevocably forced to dwell with the coronavirus (Gössling et al., 2020). Against this background, Protection Motivation Theory (PMT) has garnered much academic attention as a cognitive and affective process to explain the avoidance and cautious travel behavior during COVID-19 (Qiao, Ruan, & Pabel, 2021; Rather, 2021; Wang, Liu-Lastres, Ritchie, & Mills, 2019; Zheng, Luo, & Ritchie, 2021). The theory postulates protective behaviors ensuing from a situational threat such as a health crisis, along with coping appraisals of such a threat (Rogers, 1975). The role of fear has also been heightened to elucidate reactions to threats reflected through the adoption of hyper-defensive or precaution strategies (Maddux & Rogers, 1983).

Extant tourism literature predominantly attributes protective travel behaviors during the pandemic to the threat appraisals and risks perceptions of COVID-19 (Bhati et al., 2021; Chua, Al-Ansi, Lee, & Han, 2021; Nazneen, Xu, Din, & Karim, 2021), as well as the emotional reactions predisposed to such threats (Luo & Lam, 2020; Zenker, Braun, & Gyimothy, 2021; Zheng et al., 2021). While the role of negative emotions such as fear and anxiety has been emphasized for their influences on travel propensity (Kim, Yang, et al., 2021; Luo & Lam, 2020; Rather, 2021; Zenker et al., 2021; Zheng et al., 2021), the presumption of this direct causation is subject to criticism of oversimplification fallacy. Some essential components in the underlying intervening mechanism may have been overlooked (Baumeister, Vohs, Nathan DeWall, & Zhang, 2007). In this regard, personal values, being an individual’s deep-rooted beliefs grounded from one’s emotional and experiential encounters in life, shaken and reshaped by COVID-19, warrant an appropriate complement to explain and predict travel decisions and behaviors (Kim, 2020; Li & Cai, 2012). To the best of the author’s knowledge, no study by far has examined the implications of COVID-19 to ingrained personal values and the subsequent travel behaviors. The missing linkage between emotions, personal values, and travel propensity in the context of the pandemic needs to be established empirically to further the understanding of the travel considerations post-COVID-19.

To fill this gap, this study attempts to advance the understanding of protective travel behaviors during the pandemic by examining the joint

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intervention of negative emotions and personal values changes in an individual’s travel decision-making process. Values are generally referred to as a set of internal beliefs that leads a person to judge what is worthy and desirable in life (Schwartz, 1992). The universal value system proposed by Schwartz (1992) involves ten basic values in four quadrants: conservation, openness to change, self-transcendence, and self-enhancement. In contrast to emotions (as a rapid and automatic affective response to threats), values pertain to stable and conscious beliefs that maintain the meaning of life grounded in a series of cognitive processes through life experiences. The new normal amid COVID-19 has overturned the conventional way of living, traveling and interacting with people, thereby shocked the traditional values and bestowed new meanings and values to life (Daniel, Bardil, Fischer, Benish-Weisman, & Lee, 2020; Fischer et al., 2021). Nevertheless, the underlying value changes during the pandemic have not been sufficiently highlighted in the understanding of travel behaviors, nor the intriguing linkage between emotions and value (Daniel et al., 2020; Hermann, Trachsel, Elger, & Biller-Andorno, 2016; Kim, 2020).

In this study, a multimethod approach is adopted to investigate emotions and value changes among Chinese Generation Z during the pandemic. This catalytic event during their formative years is perceived to bear significant impacts on their shared beliefs, views, and attitude towards traveling (Debevec, Schewe, Madden, & Diamond, 2013). A series of focus group discussions have been conducted to excavate the participants’ deep feelings and value priorities through their experience during the pandemic. A survey then followed to verify the sequential mediation process from threat appraisals to protective travel behaviors via emotions and change of values. In addition, an extended model examined the pairwise interactions of sub-dimensions of negative emotions and personal values.

The findings of the study contribute to the existing knowledge in several aspects. First, the study enriches the protective motivation theory and threat appraisal literature related to COVID-19 by offering a framework underpinning the concurrent role of psychological emotions and personal values through a sequential mediation process. Second, it delves into the emotion–value linkage through investigations of sub-dimensions of the constructs, their interactions as well as their joint impacts on protective travel behaviors. Third, the multimethod approach presents robust findings to help academia and industry to understand the psychological formation for travel avoidance behaviors. Finally, reckoning the underlying emotional states and value priorities transformation will help destination management organizations (DMOs) formulate mitigation strategies to aid travel recovery.

2. Literature review and hypothesis development

2.1. Protection Motivation Theory

Protection Motivation Theory (PMT) has emerged as a prevalent theory to account for risk assessment and consequent behaviors during the pandemic. The theory was first put forward by Rogers (1975) to account for an individual’s cognitive appraisal process of the perceived health threats and the effectiveness of the coping responses. The primary appraisal begins with an assessment of the situational threat through its perceived severity and vulnerability (Floyd, Prentice-Dunn, & Rogers, 2000). Threat severity measures the seriousness of the threat based on personal judgment, while threat vulnerability refers to the perceived probability of the threat realization. The subsequent appraisal process focuses on the individual’s capabilities to cope with the threats through response efficacy and self-efficacy; both refer to the competence to take things under control, to think about and to dissolve threats in a rational manner (Floyd et al., 2000; Rogers, 1975).

In recent decades, PMT has been applied in a wealth of disease prevention and health promotion research to understand individual’s adaptive reactions across various health threats (Floyd et al., 2000). The theory has been extended to tourism research to explain travel protective behaviors during the pandemic, including hotel choice, travel propensity, cautious travel and travel avoidance (Bhati et al., 2021; Hsieh, Chen, & Wang, 2021; Qiao et al., 2021; Rather, 2021; Zheng et al., 2021). Maddux and Rogers (1983) propose two decision-making behaviors based on the PMT model: the precaution and hyper-defensiveness approaches. If people believe in high probabilities of threat occurrence and impacts, they will be more convinced to adopt an avoidance (hyper-defensive) strategy to minimize loss; while those who perceive lower exposure to risks and high expectation of survival from threats will adopt a precaution strategy. These strategies correspond with travel avoidance and cautious travel behavior during the pandemic (Zheng et al., 2021).

The unparalleled scope and damage brought by COVID-19 have inescapably triggered more acute reactions toward traveling; whereas cautious traveling has become a social norm, the threat appraisal is leading not only to the decision of where and how to travel, but whether to travel or not (Floyd et al., 2000; Neuburger & Egger, 2021). Travel avoidance behavior is prevalent during the pandemic due to the government’s hard-hitting policies to curb nonessential traveling and the association of uncontrollable infection risks in a foreign environment (Neuburger & Egger, 2021; Zheng et al., 2021). In particular, extant studies have highlighted the consequence of travel avoidance in the wake of a health crisis (Cabyanto, Wiblishauser, Pennington-Gray, & Schroeder, 2016; Chua et al., 2021; Kwok et al., 2020; Nazneen et al., 2021). Based on the above discussion, the following hypothesis was proposed.

H1. Threat appraisal is positively associated with travel avoidance behavior.

2.2. Mediating effects of negative emotions

The classical basic emotion theory proposed by Ekman (1992) identifies emotions as broadly shared natural instinctive states of mind, such as happiness, anger, and sadness. Lee, Broderick, and Chamberlain (2007) claim that emotions are typically inherent affective responses notwithstanding racial or cultural differences. To investigate the negative emotions throughout the COVID-19 crisis, the current study draws upon the negative emotions defined by Harmon-Jones, Bastian, and Harmon-Jones (2016) based on neurological, biological, expressive and interactive traits, including anger, disgust, fear, anxiety, and sadness. Appraisal theorists postulate that emotions are affective responses aroused by appraisals, subject to the cognitive judgment of the self and environment (Ellsworth & Scherer, 2003; Roseman, 1996).

According to PMT, the pandemic crisis inevitably evokes threat appraisals regarding the severity and vulnerability of related risks and available coping resources. The disproportional match of high infection risk and unavailable remedies instigate emotional and affective responses to the situation, creating a state of tension (Kim, Seo, & Choi, 2021; Zheng et al., 2021). Individuals’ affective experiences in this crisis are expected to be complicated as a result of the combination of different negative emotions (Somma et al., 2020). For instance, one was prone to feel frightened by COVID-19 as the initial outbreak of coronavirus was presented as unknown yet catastrophic; fear was then transformed into depression (Mahmud et al., 2021).

The emotion of fear and anxiety, amongst other emotions, has been underscored as a natural affective response arising from the pandemic threat appraisal (Kim, Yang et al., 2021; Luo & Lam, 2020; Ozdin & Ozdin, 2020; Rather, 2021; Zenker et al., 2021; Zheng et al., 2021). In the context of tourism research, emotions have gained attention as an essential determinant in predicting COVID-induced travel behaviors (Luo & Lam, 2020; Zenker et al., 2021; Zheng et al., 2021). For instance, travel fear and anxiety are noted to associate with protective travel behaviors and weakened desire to travel (Luo & Lam, 2020; Zheng et al., 2021). Pandemic anxiety travel scale has also been deliberately developed to measure tourists’ travel anxiety during the pandemic (Zenker
From the resource conservation perspective, human beings strived to preserve, retain and attain their resources will prompt them to pursue applicable behaviors for these objectives (Hobfoll, Johnson, Ennis, & Jackson, 2003). As a result, the negative emotions engendered by the extremity of the pandemic signal a conspicuous warning of the health hazard, propelling one to adopt defensive responses to protect themselves from possible resource loss from health and safety risks associated with traveling (Kim, Seo, & Choi, 2021; Zheng et al., 2021). In addition, the induced negative emotions suggest a deprivation of personal psychological resources in response to the situation, where one will engage in strategies to replenish the loss and minimize possible further loss of resources (Lee & Ok, 2014). Such strategies entail avoiding resource-depletion behaviors, including the cancelation of future travel plans for security and peace of mind (Xie, Zhang, Morrison, & Coca-Stefaniak, 2021). Based on the above discussions, threat appraisals of the pandemic risks manifested through the induced negative emotions will, in turn, trigger individuals’ conversations of resources and discourage travel behavior. Therefore, the following hypothesis is proposed:

H2. The relationship between threat appraisal and travel avoidance behavior is mediated by negative emotions.

2.3. Mediating effects of personal value orientations

Personal values or beliefs are commonly viewed as “deeply rooted, abstract motivations that guide, justify or explain attitudes, norms, opinions and actions” (Schwartz, 2007, p. 169). Unlike needs, value represents the center of personal identity (Brewer & Roccas, 2001; Rokeach, 1973) and thus is likely to be intractable to changes (Konty & Dunham, 1997). Value is believed to be the fundamental core of humans’ cognitive system, which influences the decision-making process and ultimate behaviors such as food consumption, travel behaviors, and support for sustainable enterprises (Jang, Zheng, & Bosselman, 2017; Li & Cai, 2012). In a nutshell, values mirror consumers’ priorities, guide them to evaluate options, and finally provoke actions. Schwartz (1992) develops a universal value system involving ten basic values categorized across four quadrants: self-transcendence, self-enhancement, openness to change, and conservation (see Fig. 1). Values within each quadrant contrast with those from the opposite quadrant; for instance, stimulation and self-direction are compared with security, conformity and tradition values, with each set of values representing a distinct set of characteristics (Schwartz, 2012).

Despite the enduring nature of personal values (Konty & Dunham, 1997), value orientations are subject to change in the aftermath of major crises (Bardi, Buchanan, Goodwin, Slabu, & Robinson, 2014). Sortheix, Parker, Lechner, and Schwartz (2019) suggest that values in the cohort of young European have changed during the global financial crisis, with benevolence, tradition and security ranked with higher importance, while less importance is given to the values of stimulation, self-direction and hedonism. The endurance, board influences and devastating impacts of COVID-19 have far exceeded most of the global crises in human history, thereby leading to shifts in individual and collective values (Daniel et al., 2020; Wolf, Haddock, Manstead, & Maio, 2020). A notable increase in conservation values and a decrease in openness to change is noted at the onset of the pandemic, whereas openness gradually has bounced back and self-transcendence values have decreased as the pandemic endures (Daniel et al., 2020). The adjusted personal values will then be incorporated into the enduring prescriptive beliefs that gauge individual’s attitude and intended deeds.

Personal values and beliefs function as an inextricable linkage to behaviors. For example, the value-belief-norm (VBN) theory, as an extension of Schwartz (1992)’s value theory, attributes environmental behaviors and preferences to personal values generated through the consciousness of the issue (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). In hospitality and tourism research, similar rationale has been employed to investigate preferences for sustainable travel mode and tourists’ eco-friendly behavior (Han, Hwang, & Lee, 2017; Lind, Nordfjærn, Jørgensen, & Rundmo, 2015). Other tourism and hospitality researchers have also linked personal values to intentional and behavioral preferences, such as travel motivation (Li & Cai, 2012), event participation (Lee, Reisinger, Kim, & Yoon, 2014), and engagement in promoting sustainability (Jang et al., 2017).

The transformation of social values during COVID-19 has called for people to scrutinize their relationship with the world (Higgins-Des biolles, 2020). Some researchers argue that the pandemic has presented an invaluable opportunity to reconstruct the global economic order and an impetus for individuals to transform their travel behaviors (Hall, Scott, & Gösling, 2020; Higgins-Desbiolles, 2020). For instance, people are becoming environmentally conscious during the pandemic; they acknowledge the environmental damage posed by human behaviors and are prompted to gear their travel behaviors in a more responsible and sustainable manner (O’Connor & Assaker, 2021). In terms of pandemic compliance, individuals with conservation values tend to follow self-protection regulations, while those with self-transcendence values do so out of consideration for others (Tabernero, Castillo-Mayén, Luque, & Cuadrado, 2020; Wolf et al., 2020). In the same vein, these personal values are postulated to adopt similar attitudes towards travel avoidance behaviors. Based on the discussions on the relationship between pandemic threat appraisals, the shift of personal values and avoidance travel behavior, the following hypothesis was proposed.

H3. The relationship between threat appraisal and travel avoidance behavior is mediated by personal value orientations.

2.4. Serial mediating effects of negative emotions and personal values

Both emotions and values are widely adopted as antecedents to predict behaviors separately. Due to the common evaluative function of emotion and value, there is a call to include both factors in the overall evaluation of behavior intentions (Hermann et al., 2016; Yüksel, 2007). Han et al. (2017) extend the value-belief-norm (VBN) theory to include emotion considerations in their theoretical model for cruise travel decisions. The emotion-dominant dimension is also employed to assess the impacts on tourists’ values and holiday behaviors (Crick-Furman & Prentice, 2000). In Yüksel (2007)’s research, pleasant emotional states
of tourists are noted to enhance the consumer experience and foster their shopping values.

In essence, emotions denote an indirect feedback system that invokes the individual’s cognitive reflection process related to personal values and guides future behavior (Baumeister et al., 2007). Contrary to the spontaneous and affective nature of emotions, personal values present a more elaborated and reflective lens to account for the valence of the world and form a full-blown conscious basis for the mode of conduct (Hermann et al., 2016). In the context of COVID-19, the threat appraisals related to its traumatic and prolonged impacts are generally associated with negative emotional states, such as fear, anxiety, sadness, and other nuanced negative emotions (Park, Kim, & Kim, 2020; Rather, 2021; Zheng et al., 2021). The contagion of these negative emotions is likely to prompt a potential shift in personal value towards orientations towards certain social values, such as security, conformity, and even power-seeking (Fischer et al., 2021; Steinert, 2020). As a result, the subsequent protective travel behaviors entail shifting enduring attitudes and values far exceeding merely emotional arousals. While the threat appraisal triggers negative emotions during the pandemic, protective travel behaviors are contingent on the internalized shift of personal values. Therefore, the serial mediating roles of negative emotions and personal values were proposed.

**H4.** The relationship between threat appraisal and travel avoidance behavior is serially mediated by negative emotions and personal value orientations.

### 2.5. Generation Z

Generation Z is generally defined as the demographic cohort of individuals born between the mid-to-late 1990s and early 2010s (Dimock, 2019). This generation has been generally characterized as a technology-savvy and well-connected generation who craves security and escapism in the virtual world (Wood, 2013). Debevec et al. (2013, p. 21) suggest that a generation cohort will be shaped by the cataclysmic events that “create a shift in society and bring a new set of values to those coming of age during those events.” Generation Z is also known as the “COVID-19 Generation” or “Generation Zoom” due to the pronounced impacts of COVID-19 during their critical stage of development (Rudolph & Zacher, 2020). Significant shift and formation of distinct personal values and traits have been noted and reflected in their psychographic consumption patterns and concerns, including the resurgence of hedonism and experience, desiring for social safety net, and a shift to online and virtual consumptions (Zwanka & Buff, 2021).

Compared to other generation cohorts, Gen-Z travelers have displayed distinct characteristics; they value more on connecting with local cultures and socializing with new people than their parents do, even during COVID-19 (Lebrun, Corbel, & Bouchet, 2021). This generation, grown up with material affluence and security, exhibits high interest in fulfilling their social, self-esteem and self-actualization needs when seeking pleasure in travel activities. Owing to their pursuit of individualism, Generation Z considers their travel consumption an approach to self-expression (Francis & Hoefel, 2018). The Chinese Generation Z, which constitutes approximately 15 percent of China’s population, is emerging as the new consumer force in the market (Dragon Trail International, 2021). Given the speedy recovery of domestic tourism in China, it is high time to understand how COVID-19 has revamped the value of the young Chinese generation and influenced their travel preferences.

### 3. Methodology

The present study adopted a sequential mixed research approach (Patton, 1999) to foster a comprehensive understanding of the negative emotions and value changes induced by the pandemic and the subsequent travel behaviors. The first phase embarked with qualitative focus group discussions (Study 1) to elicit changes in personal values during the pandemic and explore their new meanings. It was followed by a quantitative phase of data collection (Study 2) to explore the underlying constructs and validate the hypotheses and conceptual model related to travel attitudes and behaviors.

#### 3.1. Methodology and results for study 1

A semi-structured focus group interview technique was leveraged to unveil participants’ views regarding the prominent changes in personal value orientations grounded from their experience during the pandemic (Litosseliti, 2003). The unprecedented pandemic was deemed a critical life event that influences Generation Z’s shared values and attitudes during their development stage. Given that Chinese Gen Z has displayed a keen interest in traveling (Dragon Trail International, 2021) and their values and travel behavior are likely to be affected by the pandemic, undergraduates from various universities in Macao were recruited for the focus group interviews.

Feng, Zhang, and Ho (2021) note that COVID-induced fear differs among Chinese students in Hong Kong, mainland China and overseas. Therefore, a total of three focus group discussions with ten interviewees were conducted in May 2021 with informants from mainland China, Hong Kong, and Macao, consisting of five males and five females (Table 1). Special measures were taken to ensure the diversity of the selected interviewee’s place of origin and incorporate variations in the value system and risk perceptions of health-related hazards. Participants were primarily recruited through social media. To be qualified to join the discussions, each potential participant needed to complete a simple survey for their demographics, perceptions of COVID-19 risks and value orientations. To enhance diversity in the discussions, participants with different backgrounds are drawn in each discussion group. An e-invitation was sent to qualified interviewees, and a reminder was sent one day before the meeting. Souvenirs were given to the participants at the end of the discussion as a token of appreciation.

The discussions focused on the ten personal values proposed by Schwartz (2012), whereas participants were asked to reflect on the transformation of values during the pandemic. They were first provided the definition of each personal value; for instance, the value of “security” was defined as “safety, harmony, and stability of society, of relationships, and self (family security, national security, social order, clean reciprocation of favours)” (Schwartz, 2003). The participants were then invited to contemplate if such values and beliefs changed after experiencing COVID-19 and if their travel attitudes and behavior adjusted accordingly. In order to better represent the abstract concepts of personal value, participants were encouraged to elaborate, in detail, situations in their daily life, since the outbreak of coronavirus, that could indicate the conscious and unconscious changes in weights of personal values.

#### Table 1

**Profile of the Interviewees in focus groups (n = 10).**

| Informant | Gender | Age | Place of Origin | Travel Preference after COVID-19 |
|-----------|--------|-----|-----------------|---------------------------------|
| 1         | Male   | 22  | Hong Kong       | Staycation in local community   |
| 2         | Male   | 21  | Shanghai        | Selective travel to low-risk    |
| 3         | Male   | 21  | Shanghai        | Travel preference for rural areas |
| 4         | Female | 20  | Shenzhen        | Avoidance of travel            |
| 5         | Female | 23  | Hong Kong       | Avoidance of travel            |
| 6         | Female | 22  | Macao           | Selective travel to low-risk    |
| 7         | Female | 21  | Macao           | Staycation in local community   |
| 8         | Female | 21  | Hangzhou        | Selective travel to destinations with clear policies |
| 9         | Male   | 22  | Shenyang        | Selective travel to low-risk    |
| 10        | Male   | 20  | Harbin          | Selective travel to low-risk    |
values (eg., personal value of security). In order to foster an environment to express their opinions freely, all discussions were delivered in Mandarin Chinese, the native language of the interviewees. The interviews ranged from 45 to 80 min and were conducted either through face-to-face or online ZOOM meetings. The discussions were audio-recorded with the informants’ consent, and the interviews ceased when there was an indication of adequate information saturation. The audio files were transcribed initially in Chinese and then translated to English. The transcripts were examined along with the field notes and cross-checked by both researchers.

The results of the focus group discussions indicate that five out of the ten values suggested by Schwartz (2012) demonstrated the most significant impacts on Chinese Gen Z during the coronavirus period (Table 2). The five pivotal values, namely security, achievement, hedonism, benevolence, and self-direction, fall into each of the Schwartz value quadrants. These values extracted from focus group discussions were induced by the pandemic and had significantly changed the participant’s way of living. Most interviewees showed a great emphasis on “security”; for instance, the first informant expressed, “I come to realize the importance of personal hygiene, including wearing masks when I am outside.” In addition, owing to more leisure time during the restricted self-quarantine, the majority of the respondents tended to uphold the importance of “achievement” geared towards personal success by learning specific expertise, such as mastering my culinary skills (Informant 2, Informant 3), and “studying a new language” (Informant 5). In the meantime, some respondents embraced the “hedonism” value and strive to “live for now” by indulging themselves in releasing pressures from the threats of coronavirus (Informant 4, Informant 8). All respondents also believed they had become more “benevolent” to families and friends because of “daily fluctuations in new confirmed cases of coronavirus” (Informant 4). For example, one of the interviewees endeavoured to “make desserts for friends who are occupied with tons of assignments” (Informant 1). When it comes to “self-direction”, the pandemic has provided time for the participants to contemplate about life and what they want to become and prompted them to reflect and explore their career path (Informant 3, Informant 8). The informants did not display observable changes during the coronavirus for the remaining values, which therefore were eliminated from the questionnaire design.

### 3.2. Methodology for study 2

A quantitative survey was conducted in the second quarter of 2021 in Macao, China, to examine the negative emotions induced by COVID-19 and the subsequent changes in personal value and travel behaviors among Chinese Generation Z. A group of tourism and hospitality undergraduate students were recruited as field investigators to collect data through a paper-pencil survey. The research team first identified gathering hotspots for young people, such as university campuses, tourism attractions, and cafes, where a convenient sample was drawn. The investigators approached the target respondents on-site and invited them to participate in the survey. The respondents were informed of the purpose of the survey and assured of the confidentiality of the data collected. Three screening questions were asked to ensure the respondents were appropriate for the survey. First, the age of the respondents should fall between 18 and 26 years old at the time of survey to fit the definition for Generation Z born between 1995 and 2010 (Seemiller, Grace, Dal Bo Campagnolo, Mara Da Rosa Alves, & Severo De Borba, 2019). The second screening question seeks to identify respondents who indicate interest in traveling. Finally, people who were not savvy travelers (traveled less than twice annually) would also be screened from the questionnaire. At last, 405 usable questionnaires were gathered with a rejection rate of 34.3%.

### 3.3. Measurement instrument

The survey adopted validated scales from the literature to ensure the reliability and validity of measurement. The questionnaire was first designed in English and converted to a Chinese version through back-to-back translation verified by the bilingual researchers. A 7-point Likert scale was adopted. A pilot test with 25 respondents was conducted, and the questionnaire was finalized with minor modifications of wordings. The final questionnaire consisted of the following:

**Threat appraisal of COVID-19.** Two items were adopted to measure perceived threat severity and three items for perceived threat vulnerability (Zheng et al., 2021).

**Arousal of emotions.** The arousal of six negative emotions with 26

### Table 2

| Value Quadrant | Value | Original Meaning (Schwartz, 2012) | Updated Meaning during COVID-19 |
|----------------|-------|-----------------------------------|--------------------------------|
| 1 Self-Transcendence | Universalism | Understand, appreciate and protect all humans and nature’s welfare | – |
| 2 Benevolence | Preserve and enhance personal and in-group welfare | Devotion to and extra care for in-group welfare because everyone lives under greater pressure of COVID-19 |
| 3 Conservation | Tradition | Respect, commit and accept the customs and cultures | – |
| 4 Conformity | Restrains of actions and inclinations likely to upset or harm others and violate norms | – |
| 5 Security | Social, relational and personal safety, harmony and stability | Personal hygiene and preventive measures attached with great importance due to the highly contagious nature of the virus |
| 6 Self-Enhancement | Power | Social status and prestige, resources and control | – |
| 7 Achievement | Personal success through demonstrating competence | The new normal offers people more flexible time to achieve self-competence through learning new/desired skills |
| 8 Openness to Change | Self-Direction | Independent thought and action – choosing, creating, exploring | The pandemic sparks more independent thinking on career path and exploration |
| 9 Stimulation | Excitement, novelty and challenge in life | – |
| 10 Openness to Change/Self-Enhancement | Hedonism | Pleasure for oneself | Live under high uncertainty, embrace doctrine of “Live for Now” |

a Values demonstrated significant presence/updated meanings during the pandemic.
items was derived from focus group discussions and previous literature, including anxiety (seven items), fear (eight items), sadness (four items), anger (three items), helplessness (two items), and disgust (two items) (Ahorsu et al., 2020; Lee, 2020; Tsai, Hsu, & Hsu, 2017).

Personal value orientations. Five personal values encompassed 17 items adopted from Schwartz (2003), including benevolence (two items), security (five items), achievement (three items), self-direction (four items), and hedonism (three items).

Protective travel behavior. A two-item scale was used to evaluate the travel avoidance behaviors (Zheng et al., 2021).

Control variables. The gender, age and education level of the respondents were adopted as the control variables for the hypotheses testing.

4. Results

4.1. Profile of the respondents

Among the 405 respondents, 43.2% were male and 56.8% were female. Generation Z was defined as those born after 1996 who will turn 26 years old by 2021 (Dimock, 2019). In this study, all participants fell within this range with 31.9% between 18 and 20 years old, 30.6% between 21 and 23 years old and 37.5% between 24 and 26 years old. The majority of the respondents held or working on a bachelor’s degree or above (83.5%). They were mostly students (78.1%), unmarried (88.1%), with a monthly income below MOP 12,000 ($1500 USD) (76.4%). Most of the respondents were from mainland China (68.1%), and others were from Macao (25.7%), Taiwan (4.2%), and Hong Kong (2%). For the average travel frequency before COVID-19, 54.8% of the respondents indicated that they traveled twice annually, others traveled three to four times (34.8%), and even five times or above (10.4%) every year before COVID-19.

4.2. Validity and reliability of the measurement items

The study aimed to examine the emotions and value specifically related to the unprecedented crisis of COVID-19, therefore exploratory factor analysis was first conducted to identify the underlying dimensions of COVID-19 induced emotions and values. Principal component analysis with varimax rotation were performed to extract factors exceeding 1.0. Only factor loadings over 0.5 with no cross-loadings were retained.

For negative emotions, after removing three items related to cross loadings and loadings less than 0.5, the remaining twenty-three emotion items were grouped into four factors related to mild negative emotions (include sadness, anger, disgust and helpless), personal anxiety, career anxiety and fear. These four emotion factors explained for 70.7 per cent of the variance, and the Kaiser-Meyer-Olkin (KMO) measure was 0.93, acceptable validation of the results.

Confirmatory factor analysis was then conducted to ensure validity and reliability of the variables within model. The overall model fit was satisfactory, with χ ^ 2 = 1580.6, df = 918, p-value < .001, CFI = 0.96, NFI = 0.91, RMSEA = 0.04, and SRMR = 0.05. The standardized coefficients of the measures were all significant, ranging from 0.63 to 0.98. The reliability of the measurement was assured by the Cronbach’s alpha, ranging from 0.80 to 0.95. The composite reliability (CR) ranged from 0.83 to 0.95, while the average variance extracted (AVE) ranged from 0.51 to .88, both indicated adequate internal consistency and convergent validity. The results for scale items and validation were summarized in Table 3.

In addition, the mean, standard deviation and inter-factor correlations of each construct were shown in Table 4. Based on the results, discriminant validity was ensured since the squared root of AVE of each construct was greater than the correlations between the paired constructs.

4.3. Testing serial mediating effects

Before the testing of hypotheses, multicollinearity diagnostics were performed by examining the variance inflation factors of the independent variables, which were all below 1.20, demonstrating no multicollinearity concerns. The serial mediation process was tested with SPSS macro PROCESS (Model 6) developed by Hayes (2017). This approach allows estimations of direct and indirect effects through serial mediators via a bootstrapping procedure (Van Jaarsveld, Walker, & Skarlicki, 2010). The full model with estimates of all path coefficients was shown in Fig. 2. Age, gender and education were controlled for in the model with no significance noted. The results indicated that the total effect of threat appraisals on travel avoidance behavior (c) was significant (β = 0.44, p < .001), hence supporting H1. However, such an effect (c’) was reduced after adding negative emotions and personal values in the model (β = 0.34, p < .001), indicating partial mediation through the serial mediators.

The indirect effects of negative emotions and personal values were tested through 10,000 re-samples with 95% bias-corrected bootstrapped confidence intervals (CI). The indirect effect is considered significant when the CI does not fall on zero. The results were shown in Table 5. The indirect effect of threat appraisal on travel avoidance behavior via COVID-19-induced emotions was significant (β = 0.046, SE = 0.023; 95% CI = [0.003, 0.094]). The results indicated mediating effect of negative emotions in the threat appraisal-travel avoidance path. Therefore, H2 was supported. By the same token, the indirect effect through personal values was also significant (β = 0.036, SE = 0.019; 95% CI = [0.002, 0.075]), supporting H3 for the mediating role of personal values to enhance the impact of threat appraisal on travel avoidance. Finally, the sequential mediating effect of emotions and personal values was also significant (β = 0.020, SE = 0.011; 95% CI = [0.001, 0.046]), demonstrating that the two factors worked jointly to mediate the relationship between threat appraisal and travel avoidance. H4 was therefore supported. The independent and joint mediating effects of negative emotions and personal values reinforced the threat appraisal mechanism of COVID-19. Initial threat appraisals induced negative emotions, which in turn impacted the personal value orientations and ultimately averted one’s desire to travel.

4.4. Structural model for first-order factors

The structural model was tested to further explore the relationships among sub-dimensions of negative emotions and personal value orientations for their pairwise interactions. The model fit was deemed adequate (χ ^ 2/df = 1.70, CFI = 0.96, NFI = 0.90, RMSEA = 0.04, and SRMR = 0.06), with sufficient R-square ranging from 0.16 to 0.79. The relationship between individual dimensions of the measures were shown in Table 6.

As indicated in the model (Fig. 3), the threat appraisal of COVID-19 for its severity and vulnerability exhibited substantial impacts on the related emotions, including mild negative emotions (β = 0.61), personal anxiety (β = 0.72), career anxiety (β = 0.65) and fear (β = 0.89), all significant at p < .001. On the other hand, the results demonstrated that different emotions have distinct impacts only on specific personal value orientations. Among the emotions, fear was more salient and exerted significant effects on value orientation of altruism (β = 0.61, p < .001) and hedonism (β = 0.34, p < .001). In contrast, mild negative emotions during COVID-19 were positively related to the personal value of target orientations for their pairwise interactions. The model fit was deemed adequate (χ ^ 2/df = 1.70, CFI = 0.96, NFI = 0.90, RMSEA = 0.04, and SRMR = 0.06), with sufficient R-square ranging from 0.16 to 0.79. The relationship between individual dimensions of the measures were shown in Table 6.

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Table 3

Scale items and validation.

| Scale items                        | Standardized Loadings | α  | CR | AVE |
|-----------------------------------|-----------------------|----|----|-----|
| **COVID-19-Induced Emotions**     |                       |    |    |     |
| Mild Negative Emotions            |                       |    |    |     |
| I felt down-hearted and blue because of COVID-19.  | 0.89                  | 0.95 | 0.95 | 0.64 |
| I could not seem to experience any positive feelings at all because of COVID-19.  | 0.87                  | 0.95 | 0.95 | 0.63 |
| I find it difficult to work up the initiative to do things because of COVID-19.  | 0.86                  | 0.91 | 0.91 | 0.63 |
| I tend to feel lonely because of COVID-19.  | 0.85                  | 0.91 | 0.91 | 0.63 |
| When frustrated, I let my irritation show because of COVID-19.  | 0.84                  | 0.91 | 0.91 | 0.63 |
| I have trouble controlling my temper because of COVID-19.  | 0.83                  | 0.91 | 0.91 | 0.63 |
| I flare up quickly but get over it quickly because of COVID-19.  | 0.80                  | 0.91 | 0.91 | 0.63 |
| I feel helpless in COVID-19 because I have no control over everything.  | 0.69                  | 0.91 | 0.91 | 0.63 |
| I feel distaste when exposed to information about the coronavirus.  | 0.67                  | 0.91 | 0.91 | 0.63 |
| I feel revulsion when exposed to information about the coronavirus.  | 0.67                  | 0.91 | 0.91 | 0.63 |
| Personal Anxiety                  |                       |    |    |     |
| I had trouble falling or staying asleep because I was thinking about the coronavirus.  | 0.84                  | 0.91 | 0.91 | 0.63 |
| I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus.  | 0.82                  | 0.91 | 0.91 | 0.63 |
| I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus.  | 0.80                  | 0.91 | 0.91 | 0.63 |
| I lost interest in eating when I thought about or was exposed to information about the coronavirus.  | 0.78                  | 0.91 | 0.91 | 0.63 |
| I cannot sleep because I am worrying about getting COVID-19.  | 0.78                  | 0.91 | 0.91 | 0.63 |
| After experiencing COVID-19, I felt scared without good reason.  | 0.76                  | 0.91 | 0.91 | 0.63 |
| Career Anxiety                    |                       |    |    |     |
| I worry about future employment because I probably would not find a job of interests due to COVID-19.  | 0.94                  | 0.94 | 0.94 | 0.88 |
| I worry about future employment because of fierce competition in the job market due to COVID-19.  | 0.94                  | 0.94 | 0.94 | 0.88 |
| Fear                              |                       |    |    |     |
| I worry a lot about COVID-19.  | 0.84                  | 0.86 | 0.86 | 0.57 |
| I am most afraid of COVID-19.  | 0.78                  | 0.87 | 0.87 | 0.57 |
| COVID-19 is almost always terminal.  | 0.77                  | 0.86 | 0.86 | 0.57 |
| I am afraid of losing my life because of COVID-19.  | 0.70                  | 0.85 | 0.85 | 0.57 |
| COVID-19 is an unpredictable disease.  | 0.65                  | 0.85 | 0.85 | 0.57 |
| Personal Value Orientations       |                       |    |    |     |
| Target-orientation (Self-Direction & Achievement) | 0.93                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I strive to do better than others.  | 0.91                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I like to impress other people.  | 0.89                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I want people to admire what I do to show my abilities.  | 0.85                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I tend to do things in my original way.  | 0.76                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I tend to make my own decisions about what I do.  | 0.73                  | 0.92 | 0.92 | 0.63 |
| During COVID-19, I tend to rely on myself more.  | 0.73                  | 0.92 | 0.92 | 0.63 |

Note: χ²/df = 1.72, CFI = 0.96, NNFI = 0.91, RMSEA = 0.04, SRMR = 0.05, α = Cronbach’s alpha, CR = composite reliability, AVE = average variance extracted.

| Scale items                        | Standardized Loadings | α  | CR | AVE |
|-----------------------------------|-----------------------|----|----|-----|
| **Altruism (Security & Benevolence)** |                       |    |    |     |
| During COVID-19, I try harder to avoid getting sick.  | 0.81                  | 0.88 | 0.88 | 0.51 |
| During COVID-19, I tend to care more about personal hygiene.  | 0.73                  | 0.86 | 0.86 | 0.51 |
| During COVID-19, I tend to be more concerned that social order be protected.  | 0.73                  | 0.86 | 0.86 | 0.51 |
| During COVID-19, I tend to care for other people around me more.  | 0.71                  | 0.86 | 0.86 | 0.51 |
| During COVID-19, I tend to wash my hands more regularly.  | 0.67                  | 0.86 | 0.86 | 0.51 |
| During COVID-19, I tend to devote to people close to me more.  | 0.63                  | 0.86 | 0.86 | 0.51 |
| **Hedonism**                      |                       |    |    |     |
| After experiencing COVID-19, enjoying life’s pleasures becomes more important to me.  | 0.97                  | 0.95 | 0.95 | 0.86 |
| After experiencing COVID-19, I tend to seek every chance I can to have fun.  | 0.91                  | 0.95 | 0.95 | 0.86 |
| After experiencing COVID-19, the desire to enjoy life becomes stronger.  | 0.91                  | 0.95 | 0.95 | 0.86 |
| **Threat Appraisal**              |                       |    |    |     |
| Perceived threat severity         |                       |    |    |     |
| I feel health threat to tourists.  | 0.98                  | 0.87 | 0.87 | 0.78 |
| Infection consequence for tourists is serious.  | 0.70                  | 0.86 | 0.86 | 0.78 |
| Perceived threat vulnerability    |                       |    |    |     |
| I think that the possibility of contact with coronavirus infected tourists is high.  | 0.87                  | 0.86 | 0.86 | 0.78 |
| I feel high risk of being infected.  | 0.83                  | 0.86 | 0.86 | 0.78 |
| I think that the possibility of contact with coronavirus infected people (non-tourists) is high.  | 0.76                  | 0.86 | 0.86 | 0.78 |
| **Protective Travel Behavior**    |                       |    |    |     |
| Travel avoidance                  |                       |    |    |     |
| I delay making decisions about traveling in the COVID-19 period.  | 0.87                  | 0.87 | 0.87 | 0.78 |
| I will avoid traveling in the COVID-19 period.  | 0.85                  | 0.87 | 0.87 | 0.78 |

The findings indicated that mild negative emotions impacted target-orientation (β = 0.19, p < .05). Finally, preventive travel behavior was positively associated with altruism (β = 0.57, p < .001) but negatively associated with target orientation values (β = -.24, p < .01).

The bond between personal and career anxiety and value orientations was not statistically significant, as career anxiety is deemed a temporary reaction to coronavirus. In
addition, protective travel behavior was impacted negatively by target-orientation value but positively by altruism. It seemed that those who would like to spend time on self-direction and personal achievement would not travel during the pandemic, while those who tended to be altruistic would consider others’ safety, thus performing protective travel behaviors. This is in line with research on pandemic measure compliances that individuals with self-transcendence and conservation values tend to adhere to regulations while those with openness and self-enhancement values had a hard time restricting their freedom and drive for achievement (Tabernero et al., 2020; Wolf et al., 2020).

5. Discussion and implications

COVID-19 has dramatically transformed the tourism landscape. Desire to travel has been greatly inhibited by psychological emotions and values amplified during the crisis. This study highlights the internalization process from threat appraisal to travel protective behaviors elucidated through negative emotions and personal value orientations. The results indicate that fear is not the only salient emotion that significantly shapes personal values during a health crisis. Diversity of values are manifested through a spectrum of emotional arousals amid the risk assessment process. Three types of value orientations, including target orientation, altruism, and hedonism, showcase distinctive impacts on individuals’ protective travel behaviors. The emotion–value linkage of psychological determinants has provided a beckoning avenue for understanding travel behaviors which paves the way for tourism recovery.

5.1. Theoretical implications

There are several notable contributions offered by this study to tourism and threat appraisal research in the COVID-19 context. First, this study initially extends and consummates the theory of protective travel behavior by advancing the intriguing emotion–value linkage. While protective travel behavior has garnered academic attention in the wake of COVID-19, existing research is predominantly centered on the emotional impacts on subsequent travel attitudes and behaviors (Kim, Yang, et al., 2021; Rather, 2021; Zheng et al., 2021). Undoubtedly, emotions are the most salient and immediate responses of the threat stimulus, but the basis for attributing protective behaviors to emotions by direct causation appears untenable (Baumeister et al., 2007). To respond to the call for more in-depth consideration of the cognitive

Table 4
Mean, standard deviation and inter-factor correlation.

| Mean  | S.D.  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------|-------|---|---|---|---|---|---|---|---|---|----|
| 1. Threat Vulnerability | 4.87 | 1.49 | 0.82 |   |   |   |   |   |   |   |    |
| 2. Threat Severity | 6.03 | 1.18 | 0.62 | 0.85 |   |   |   |   |   |   |    |
| 3. Mild Negative Emotions | 2.33 | 1.33 | 0.20 | 0.04 | 0.80 |   |   |   |   |   |    |
| 4. Personal Anxiety | 2.17 | 1.26 | 0.27 | 0.03 | 0.76 | 0.80 |   |   |   |   |    |
| 5. Career Anxiety | 4.10 | 1.95 | 0.31 | 0.22 | 0.39 | 0.50 | 0.94 |   |   |   |    |
| 6. Fear | 3.76 | 1.49 | 0.48 | 0.29 | 0.51 | 0.64 | 0.57 | 0.75 |   |   |    |
| 7. Target-Ont | 3.65 | 1.55 | 0.27 | 0.15 | 0.39 | 0.42 | 0.26 | 0.36 | 0.79 |   |    |
| 8. Altruism | 4.98 | 1.32 | 0.38 | 0.35 | 0.18 | 0.29 | 0.36 | 0.54 | 0.57 | 0.72 |    |
| 9. Hedonism | 4.70 | 1.76 | 0.29 | 0.21 | 0.23 | 0.28 | 0.29 | 0.38 | 0.58 | 0.56 | 0.93 |
| 10. Travel avoidance | 5.38 | 1.48 | 0.26 | 0.31 | 0.01 | 0.01 | 0.26 | 0.31 | 0.05 | 0.37 | 0.09 |

Note: all correlations are significant at the 0.01 level. Diagonal elements are the square root of AVE for each construct.
process from emotions to behaviors, this study proposes the role of entrenched personal value orientations and their transformations during the health crisis as a crucial intervention factor. Emotional and valuation factors are presumed to bear mutual influences, but strong empirical evidence of their relationship is still insufficient (Hermann et al., 2016). This study exhibits the watershed between the influence of emotions and of personal values during COVID-19. The former represents nuances of affective reactions sparked by the event, while the latter are ingrained and conscious transformations precipitated within the life experience, with far-reaching influences. The articulation of the emotion–value path enriches the understanding and prediction of an individual’s avoidance of travel. That is, the short-term negative emotions arising from COVID-19 do not instinctively lead to protective travel outcomes until the emotions amass and escalate to transfigure the original values held by the individual. The findings further the protective motivation theory and suggest further exploration of interrelation and dependence among individual psychological constructs and their impacts on travel behaviors.

Second, while the importance of fear as an emotional response to COVID-19 has been widely discussed in the literature (Ornell, Schuch, Sordi, & Kessler, 2020; Zheng et al., 2021), other negative emotions such as anxiety, sadness and anger have not received extensive attentions in the field of tourism. In the same vein, extant tourism research on personal values is also prone to focus on pre-selected values without realizing the dynamics among different value orientations (Kim, 2020). To avoid such shortcomings, this study presents a comprehensive theoretical framework with considerations of major emotions and values defined by Ekman (1992) and Schwartz (1992). Specifically, a multi-method approach was adopted to include both qualitative and quantitative stances into the research. As a result, the robust results are able to capture the information richness of individual encounters and allow generalization to a broader population.

The findings support a spectrum of negative emotions triggered by the threat appraisal of COVID-19. In line with previous studies in tourism, fear is the most salient emotion due to the heightened perception of the severe loss of human lives during COVID-19 (Kim, Yang, et al., 2021; Rather, 2021; Zheng et al., 2021). Personal anxiety, career anxiety, and other negative emotions, on the other hand, are considered milder emotions that may not linger. The results also reveal that some negative emotions experienced during COVID-19, in accordance with their perceived intensity, lead to contemplation and priority setting of an individual’s value system. For instance, aligning with previous studies, the extreme emotion of fear is associated with values of altruism, including security and benevolence (Fischer et al., 2021; Steinert, 2020). More interestingly, in the unparalleled case of COVID-19, the linkage between fear and hedonism is noted. This alignment is possibly due to the uncontrollable nature of the pandemic, where efforts are deemed worthless, and people tend to live just for the
day. On the other hand, nuanced negative emotions are associated with target-orientation since individuals with mild symptoms still believe in tomorrow and strive hard to equip themselves and prepare for the future. The study has reinforced the intriguing emotion–value relationship and offers insights into the underlying rationale, through which the psychological mechanism leading to protective behaviors is established.

Third, this study advances to the uncharted area that attributes protective travel behaviors to various personal values. As indicated in the findings, certain personal values are associated with travel avoidance and behaviors while others either do not impact or impact reversely. For instance, individuals prioritizing altruism tend to avoid traveling for security reasons and the protection of all; while those who emphasize target orientation will not practice protective travel behaviors, as they may view traveling as necessary to accomplish their progressive and career goals. This research, by portraying how negative affective feedbacks are processed into the value system and protective behaviors, contributes to new knowledge in understanding the psychological chain of reactions and consequences in the assessment of the health threat.

5.2. Managerial implications

To recover from the devastating shocks of the COVID-19 pandemic, it is crucial for destination marketing organizations (DMOs) to fully comprehend individuals’ negative emotions and value orientations in order to pave the way back to vibrant tourism (Chua et al., 2021). Therefore, this study offers empirical insights for DMOs — highlighting the transformation from negative emotions to personal values and how DMOs can engage with possible measures to incite one’s travel intentions.

First of all, it is worthy for DMOs to be conscious that not all the negative emotions will ultimately contribute to travel avoidance, as people reported to have mild negative emotions can harness such grief, anger and helplessness as the motivator to travel. These high-caliber individuals gear their values and beliefs towards the target orientation and are still eager to travel for their own achievement. During the pandemic, while people are restrained in certain aspects of living, they strive to demonstrate their capabilities by achieving success in other areas, such as cooking, art and photography. They are not so much affected by the fear sentiments, so their traveling desire is not deterred, but their passion is invoked to affirm their values. For this segment, traveling with a purpose to showcase or improve their competence (e.g., photogenic spots, cultural and creative activities) is particularly attractive. It is necessary for the tourism operators to adapt to the new mode of traveling, which craves interesting and unique travel experiences yet promises safety from COVID-19. To this end, DMOs should reframe travel promotion amid COVID-19 to focus on positivism to accept the “new normal” reality. Therefore, DMO communications should be sincere, direct and timely. Highlighting the genuine health safety concerns and the measures undertaken to address such concerns can successfully relieve and mitigate fear emotions and the subsequent travel avoidance behaviors.

5.3. Limitations and future research directions

As a preliminary study to investigate Chinese Gen-Z’s cognition and emotions during COVID-19 and the related changes in their values and travel behaviors, this research is essentially exploratory in nature and subject to some limitations. Firstly, the study was conducted to explore Chinese behaviors, of which the results may not be replicated and generalized to other cultural regions. Further research in different regions could further complement the framework. Secondly, this study adopted the purposive method to select Gen-Z as the subject sample. Future investigations are encouraged to further compare Gen-Z with other age cohorts in the tourism research. Another limitation is that all the constructs, particularly negative emotions and value orientations, were self-reported, hence susceptible to social desirability bias. Additionally, this study focuses on the general travel attitudes of Generation Z during the pandemic, without consideration to the types and modes of travel. Extending the investigation to long-haul and short-haul travel could contribute further to the understanding of pandemic travel behaviors of the young generation. Finally, this study focuses on people’s travel intention instead of the actual travel behavior during the COVID-19 period. Further studies are recommended to compare actual travel behavior pre- and post-COVID-19.

Declaration of competing interest

All authors declare they have no conflict of interest.

Appendix A. Questionnaire

This survey investigates travel behavior of Chinese Generation Z (aged from 18 to 26 years old) during the coronavirus pandemic. Please read carefully the following instructions. It takes about 5 min to complete the questionnaire and the information will be kept in confidentiality. Thank you for your participation!
Part 1. Screening questions

- Is your age between 18 and 26? □ Yes □ No (survey ends)
- Are you interested in traveling? □ Yes □ No (survey ends)
- Did you travel twice or above every year before COVID-19? □ Yes □ No (survey ends)
- Did you travel twice or above every year before COVID-19? □ Yes □ No (survey ends)

Part 2. Threat appraisal of COVID-19

PTS: Perceived threat severity
- Infection consequence for tourists is serious. 1 2 3 4 5 6 7
- I feel health threat to tourists. 1 2 3 4 5 6 7
- I feel high risk of being infected. 1 2 3 4 5 6 7
- I think that the possibility of contact with coronavirus infected tourists is high. 1 2 3 4 5 6 7
- I think that the possibility of contact with coronavirus infected people (non-tourists) is high. 1 2 3 4 5 6 7

ANX: Anxiety
- I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus. 1 2 3 4 5 6 7
- I had trouble falling or staying asleep because I was thinking about the coronavirus. 1 2 3 4 5 6 7
- I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus. 1 2 3 4 5 6 7

Part 3. Affective experience in COVID-19

- I think that the possibility of contact with coronavirus infected people (non-tourists) is high. 1 2 3 4 5 6 7
- I think that the possibility of contact with coronavirus infected tourists is high. 1 2 3 4 5 6 7
- I feel high risk of being infected. 1 2 3 4 5 6 7
- I feel health threat to tourists. 1 2 3 4 5 6 7

PTV: Perceived threat vulnerability
- I feel health threat to tourists. 1 2 3 4 5 6 7
- I feel health threat to tourists. 1 2 3 4 5 6 7
- I feel health threat to tourists. 1 2 3 4 5 6 7

Part 4. Value orientations in COVID-19

SEC: Security
- Having experienced COVID-19, I tend to avoid anything that might endanger my safety. 1 2 3 4 5 6 7
- Having experienced COVID-19, I tend to be more concerned that social order be protected. 1 2 3 4 5 6 7

ACH: Achievement
- Having experienced COVID-19, I want people to admire what I do to show my abilities. 1 2 3 4 5 6 7
- Having experienced COVID-19, I tend to devote myself to people close to me more. 1 2 3 4 5 6 7

SEL: Self-direction
- Having experienced COVID-19, I tend to do things in my original way. 1 2 3 4 5 6 7
- Having experienced COVID-19, I tend to be keen on breaking free from restrictions (of school, family, etc.). 1 2 3 4 5 6 7

HED: Hedonism
- After experiencing COVID-19, I tend to seek every chance I can to have fun. 1 2 3 4 5 6 7
- After experiencing COVID-19, enjoying life’s pleasures becomes more important to me. 1 2 3 4 5 6 7

Part 5. Protective travel behavior in COVID-19

TA: Travel avoidance
- I will avoid traveling in the COVID-19 period. 1 2 3 4 5 6 7
- I delay making decisions about traveling in the COVID-19 period. 1 2 3 4 5 6 7

Part 6. Demographic information

- Age □ 18–20 □ 21–23 □ 24-26
- Gender □ Male □ Female
- Education Level □ Secondary School □ Undergraduate □ Post-graduate
- Marital Status □ Single □ Married □ Divorced

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