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Cruising through a pandemic: Or not?

Gabby Walters^{*,1}, Thomas Magor, Sarah Kelly, Ann Wallin

UQ Business School, University of Queensland, Australia

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ABSTRACT

While the cruise industry is expected to rebound from the pandemic, the features of the cruise value offering that once appealed to the market and cruise specific consumer behaviour have changed. This project employs a choice experiment to determine how COVID-19 has influenced 808 consumers' preferences for and trade-offs between specific aspects of the cruise experience across four different COVID-19 scenarios. Such insight is highly valuable for cruise organisations seeking to better understand the evaluative criteria by which their consumer segments are now guiding their decisions. Theoretically, we test how Protection Motivation Theory affects preferences under different risk scenarios. Practical contributions include a need to revise marketing communications, promotions, and service to emphasise COVID-19 safe measures, outdoor cabins and cancellation refunds, and that adjustments to targeted cruise packages are needed based on age and cruise experience among segments. Our research is the first to examine preferences of cruise consumers adopting choice modelling method. We find that overall, while the way people travel has changed, the underlying preferences of travellers in this market is largely unaffected by a simulated evolving risk profile presented.

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Introduction

Prior to COVID-19 the cruising industry experienced significant growth with approximately 28.5 million people globally choosing to cruise in 2018 and an estimated 32 million in 2020 (Giese, 2020). This was a promising outlook for the global economy, especially for developing nations with economic dependence on the industry (da Silva, 2021). By February 2020, however, the cruising industry became front and centre of the COVID-19 pandemic, as a well-known cruise liner played host to a large outbreak. This resulted in significant reputational damage for not only the cruise line but the entire industry, which came to a standstill in the wake of the pandemic (Giese, 2020). This suspension in cruising activity came at an estimated cost of \$77 billion dollars to the global economy (Cruise Lines International Association Australasia, 2021). While we expect the industry to rebound, the underlying research question we address is whether or not varying levels of ongoing COVID-19 risk influence travellers' preferences for the features of cruise packages. This is important to provide much-needed evidence to inform the industry in COVID-19 and future pandemic crisis response and recovery.

There remains some debate regarding the socio-economic benefits of cruising for developing nations (e.g., Cheer, 2017; MacNeill & Wozniak, 2018), but there is no doubt that COVID-19 has had a significant impact on those who rely on this form of tourism. The pandemic-induced damage to the cruise sector has left a \$150 billion USD gap in the global economy (Giese, 2020). The Australasian arm of the Cruise Lines International Association (CLIA) has lobbied the Australian government to resume

Corresponding author.

E-mail addresses: g.walters@uq.edu.au (G. Walters), t.magor@business.uq.edu.au (T. Magor), s.kelly@business.uq.edu.au (S. Kelly), a.wallin@business.uq.edu.au (A. Wallin).

¹ Lead author.

cruising with a promise of rigid COVID-19 safety measures on board (Cruise Lines International Association Australasia, 2021). Government decision makers are not the only stakeholders that the industry will need to reassure. Research by Holland (2021) indicates that consumer confidence towards cruising has been severely impacted by the industry's perceived failures in the handling of the COVID-19 outbreak.

We test how travellers' scores on the dimensions of Protection Motivation Theory affects their preferences under different risk scenarios. Protection Motivation Theory has been demonstrated in the tourism literature as being a highly valid and relevant approach to understanding the impact of COVID-19 and health related risk generally on travel behaviour, see for example Wang et al. (2019), Zheng et al. (2021), Hsieh et al. (2021) and Bhati et al. (2021). COVID-19 will continue to generate uncertainty in the cruise industry well after the widespread rollout of vaccines and relaxation of restrictions on movement. We explore how varying the level of COVID-19 risk may affect travellers' preferences across four different scenarios ranging from no/low COVID-19 risk to moderate/high risk. This scenario testing facilitates understanding of how a sudden resurgence of COVID-19 may alter the preferences of those considering a cruise, which in turn will enable the industry to position offerings optimally.

Literature review

Since the onset of the COVID-19 pandemic, notable changes to travel planning and decision making have been observed. For example, Kim et al. (2021) in their consumer choice study show tourists are now likely to seek holiday options that cater to their safety needs which subsequently leads to preferences for intermediate and non-extreme options when travel planning. In pre-COVID-19 times, the quality of tourist accommodation was typically defined by the level of luxury and facilities (Pappas & Glyptou, 2021) while sanitation and hygiene are now more likely to have an increased salience. As restrictions on mobility continue to occur across the world, the level of trust tourists have in such health-related policies will have some relevance to traveller decision making. Shin et al. (2021) demonstrated that political trust will impact travel willingness and frequency both during and beyond the pandemic era. Shin et al. (2021) further suggest that social norms are also important when considering travel during the pandemic.

As COVID-19 has evolved, so has the holiday preferences of tourists. For example, Abdullah et al. (2020) reveal that since the pandemic, more tourists are using private modes of transport. Walters (2020) suggests that tourists feel more confident traveling in their own vehicles as opposed to flying or taking modes of transport where they would be sharing with others outside their family or social circles. Regional and coastal destinations have become highly popular at the expense of capital cities and urban centres due to the new-found preference for open spaces where tourists are able to safely distance themselves from others and avoid crowded spaces (Canina & McQuiddy-Davis, 2020; Kock et al., 2020; Rogerson & Rogerson, 2021; Walters, 2020; Sohn et al., 2021). Tourists are also choosing to travel closer to home regardless of whether government restrictions are in place (Li et al., 2021; Yilmazkuday, 2020). Kock et al. (2020) argue that the psychological concept of ethnocentrism offers a potential explanation for this observed change in tourist behaviour, suggesting that tourists may choose to travel closer to home to support their own local tourist economy, while other research suggests local preferences are simply a travel risk reduction strategy (Matiza, 2020; Wolff & Larsen, 2016). In China, a population that is accustomed to mass travel in large tour groups, more tourists are now preferring to travel independently or in small groups while at the same time substituting iconic tourist attractions with less well-known or 'off the beaten track' locations (Wen et al., 2020). In contrast Williams, Chen, Li & Balaz (2022) concluded that tourists' preferences to travel close to home can be explained by their finding that long haul destinations were more associated with uncertainties, ambiguities and, consequently, a higher degree of risk. When it comes to travel frequency, most studies in this context demonstrate that COVID-19 has and will continue to result in a decrease in travel activity (e.g., Chua et al., 2021; see for example, de Haas et al., 2020; Neuburger & Egger, 2021).

The evidence is clear that COVID-19 has raised the importance of health and safety risk among most travellers. While the extent to which COVID-19 related health concerns impact travel behaviour may differ according to demographic and cultural background (Chua et al., 2021; Golets et al., 2021; Kim et al., 2021, Williams et al., 2022; Pappas, 2021), research indicates that health and safety still feature strongly in evaluation of travel-related risk (Pappas & Glyptou, 2021). According to Chua et al. (2021) tourists' concerns relating to health risk have created uncertainty, particularly when traveling abroad. The 'home is safer than abroad' bias implies that people tend to rate their home country as less risky than other foreign countries, regardless of where their home is located (Wolff et al., 2019). This makes sense in the COVID-19 context as tourists are likely to have familiarity with their own country's medical systems, number of cases, vaccination rates and government travel restrictions and regulations.

COVID-19 and cruising

A cruise holiday typically involves overseas travel, within a contained environment that on the one hand poses a heightened risk of infection due to the high density of tourists in the one space, yet on the other hand provides a COVID-19 safe 'travel bubble' assuming passengers and crew are fully vaccinated and COVID-19 free. Research by Holland, Mazzarol, et al. (2021a) suggests that the latter scenario is far from the perceptions of prospective cruise passengers. Looking at both the UK and Australian markets, Holland and colleagues explored the perceptions of cruisers and non-cruisers towards cruising. It was apparent that Australians have less faith in the cruise industry to keep them safe than those from the UK, with the authors claiming that this is partially due to the Australian media's negative portrayal of the cruising industry in the early days of COVID-19 when a ship docking in Sydney was responsible for a major community outbreak. Interestingly, Holland et al.'s (2021a) research revealed

no difference in risk perceptions between cruisers and non-cruisers. Those who had cruised previously had more confidence in cruise operators to keep them safe and well. This contrasts with Holland, Mazzarol, et al.'s (2021a) study on Australian cruisers that found previous cruisers were more concerned about health risk than non-cruisers.

Consumer trust is another construct to be explored in a cruise related context, yet the literature implies that the pandemic has not only changed the way in which trust influences the consumers' risk perception towards cruising, but also who they are more likely to trust. For example, according to research undertaken before COVID-19, consumer trust was shown to reduce perceived risk, anxiety, and concern towards cruising (Forgas-Coll et al., 2014). Quintal et al. (2021) on the other hand explored the role of trust in risk-reducing behaviours and concern towards cruise travel in Australia during the pandemic. Interestingly the authors revealed that consumers are more likely to trust the voice of the Australian government as opposed to the cruise lines themselves and consequently, consumers who placed their trust in the government were more concerned about cruise travel. This finding supports the notion that governments can be quite influential when it comes to travel decision making during a pandemic. The banning of cruising during the time of this study has clearly sent a strong message to consumers in relation to the risks associated with this form of travel.

During the pandemic there have been several published works that explore how COVID-19 has impacted tourists' risk perceptions in relation to cruising, as discussed. Collectively this research presents valuable managerial implications concerning how to manage and respond to public health concerns towards this form of travel. A recent overview of COVID-19 related tourism research by Yang et al. (2021) revealed the need for post COVID-19 research which reflects representative samples and the effects of COVID-19 risk on travellers' preferences for the features of cruise packages. Our review found extensive application of relevant risk perception theoretical frameworks and concluded that much of the research is cross sectional and associated with the early stages of the COVID-19 pandemic. Our research responds to this gap in the literature by analysing the effects of constantly changing levels of COVID-19 risk on cruise travellers' preferences using a rigorous choice-based conjoint model that embeds the concepts of Protection Motivation Theory.

Theoretical framework

Perceived risk has been operationalised by several tourism scholars over the years to better understand the specific risks that apply to tourism and tourism destinations. Roehl and Fesenmaier (1992) for example present seven risk factors perceived to affect tourism: equipment, financial, physical, health, satisfaction, social and time. Reisinger and Mavondo (2005) explored perceptions of risk relating to health, finance, terrorism, and socio-cultural differences. Most studies agree that perceived risk is a significant determinant of destination choice. While health related risk is a common factor when assessing tourism related risk, these risk perception frameworks do not incorporate insights into how travellers' evaluate and respond to the dynamic nature of risk. Therefore, to better understand the interplay between choice preferences and risk perceptions in the COVID-19 context, we employ Protection Motivation Theory. Our contribution provides further evidence for the growing body of knowledge on how Protection Motivation Theory affects travel preferences using a choice-based method of analysis not previously used to study this theory.

Protection Motivation Theory suggests that individuals go through two cognitive mediating processes when evaluating risk. These processes comprise four dimensions. The first two dimensions, perceived severity, and perceived vulnerability, involve the appraisal of the threat in terms of its severity and likelihood of occurrence. The third and fourth dimensions, self-efficacy, and response efficacy, together represent the individual's assessment of their own ability to protect themselves against the threat by performing a recommended behaviour or action and the extent to which they believe the action or behaviour will be effective (Rogers & Prentice-Dunn, 1997). We do not present any specific hypotheses but expect to find differences across individuals with respect to how their profiles captured by these dimensions affect cruise travel package preferences. We do not make specific formal hypotheses as our aim is to examine the effects of varying levels of COVID-19 risk on preferences. Protection Motivation Theory has featured in tourism studies investigating COVID-19 and travel risk extensively (e.g., Bhati et al., 2021; Hsieh et al., 2021; Quintal et al., 2021; Yuen et al., 2021; Zheng et al., 2021). While earlier tourism studies employing Protection Motivation Theory tended to focus on single dimensions such as perceived vulnerability (Schroeder et al., 2013; Sönmez & Graefe, 1998) or perceived severity (Law, 2006), the majority of COVID-19 and tourism related studies have applied this framework in its entirety confirming a positive relationship between the tourists cognitive evaluation of risk, their ability to cope and their motivation to protect themselves against the risk. A key reason for what one might conclude as an overabundance of tourism research that applies Protection Motivation Theory to the COVID-19 and travel context is the fact that this framework was created for the assessment of people's perceptions of health threats and their uptake of preventative recommendations (Rogers & Prentice-Dunn, 1997). According to Wang et al. (2019) Protection Motivation Theory is one of the most used models in public health to evaluate individual healthrelated behaviours. It is no surprise that the Protection Motivation Theory framework has been applied to a recent study that explored tourists' willingness to engage in health-related self-protection behaviour when cruising (see Fisher et al., 2018).

Method

Sample

This study recruited Australian residents who had an interest in cruising. Respondents were invited to participate in the study via the panel provider PureProfile and were told that the purpose of the study was to understand preferences for cruise travel packages in Australia. Respondents who spent <5 min completing the questionnaire were not included in the analysis.

Research design

Respondents completed a mix of rating scale items to measure travellers' scores on the dimensions of Protection Motivation Theory and a discrete choice experiment (DCE) to measure travellers' preferences for the features of cruise packages under four levels of COVID-19 risk. We use a form of choice-based conjoint analysis that provides a model of hypothetical behaviour in response to hypothetical scenarios. Compared to methods which might rely on rating scales of intentions or perceptions, our approach has the advantage of being able to examine potential behavioural changes in a tractable manner. Given the context and the timing of our research it was not possible to model actual behaviour by way of a field study in this market. Eight attributes described the hypothetical cruise packages in the choice tasks, five related to traditional cruise considerations (ship size, length of trip, bonus, cabin type and price) and three specific to COVID-19 (precautions, medical and cancellation policies). The traditional cruise attributes were developed through a literature review of papers investigating preferences for cruise attributes. From the review a list of attributes that (a) had evidence that they impacted preferences, and (b) were physical attributes that would be suitable to code in the experiment. This list was then compared to cruise company websites, with the attributes being used as attributes for cruise packages in-market being selected for the final design. The levels of the attributes reflected the high and low range of levels occurring in the Australian cruise marketplace. The three COVID-19 attributes were developed from desktop research discussing the common consumer concerns about travel at the time: precautions being taken at travel sites, access to appropriate medical care and cancellation policies. The final stimuli adopted were also shown to cruise industry experts and compared to recent cruise advertising campaigns. The discrete choice experiment (DCE) approach was used to leverage the stimuli manipulation structure of a classic experiment and the trade-off response structure of a choice experiment.

Procedures

Respondents were asked about their general and cruise-specific travel experience, willingness to cruise in the near (within 12 months) and distant future (within 3 years). Burton et al.'s (1998) risk aversion scale and items measuring the five dimensions of Protection Motivation Theory, adapted from Witte et al. (1998), were also included in the survey. The items specific to self-efficacy, response efficacy and intentions to engage in risk reduction behaviours were modified to represent the COVID-19 context and risk-taking propensity, threat and coping appraisal captured respondents' level of agreement. All items were measured using a 5-point Likert scale. Respondents then completed the DCE. The choice experiment uses systematically manipulated alternatives (Crouch et al., 2007) that allow us to capture respondents' trade-offs. The experimental conditions we designed using an orthogonal main effects plan (OMEP) generated using SPSS software following the procedures outlined in Street et al. (2005). Compared to other quantitative methods, particularly structural equations modelling (SEM), choice-based conjoint and choice modelling more generally is under-utilised in tourism. Viglia and Dolnicar (2020) review the use of experiments in tourism and Kemperman (2021) specifically discuss the use of choice modelling in tourism. In our study, respondents completed nine choice sets with each containing three cruise packages described by eight attributes. Fig. 1 depicts an example choice set from our study. (See Tables 1 and 2.)

Econometric specification

We used the conditional logit (McFadden, 1974) model to find travellers' preferences for the attributes of cruise packages. A random parameters model (Revelt & Train, 1998; Walters et al., 2019) was also estimated, but was only estimable for the main effects of each of the cruise package attributes, hence is excluded from our results. A fully parametrized random parameters model was almost attempted but due to numerical complexities could not be estimated (see Walker, 2002; Chiou & Walker, 2007 for a full overview of these estimation issues). The conditional logit model presented includes interactions between each of the attributes of the hypothetical cruise packages and respondents' scores on the Protection Motivation Theory scales, interactions with each of the COVID-19 risk scenarios to determine how the theory of Protection Motivation Theory manifests under different COVID-19 risk scenarios and interactions between individual level attributes (age, gender, income, and cruise experience) and the no-choice options. All choice models were estimated using the choice modelling suite available in Stata 16.

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Results

Respondent characteristics and previous travel experience

The data were collected during April of 2021. A total of 808 usable responses were collected that generate 36,360 observations from 7272 choices. Incomplete and responses which spent <5 min in total to complete the questionnaire were not included giving a usable response rate of 74 % from a total of 1087 responses. The final sample contains 55 % females, the most common age bracket is those above 65 years and most have completed a tertiary education. About half have income exceeding AUD\$80,000 per

Table 1

Sample Characteristics (N = 808).

Sample dimension	n	%	Sample dimension	n	%		
Gender			Have you ever been on a cruise holiday?				
Female	443	55 %	Yes	381	47 %		
Male	365	45 %	No	427	53 %		
Prefer not to respond	0	0 %					
Age			How many times have you been on a cruise?				
18–25	84	10 %	1–3 times	273	72 %		
26–35	145	18 %	4–5 times	46	12 %		
36–45	129	16 %	>5 times	62	16 %		
46-55	120	15 %					
56–65	131	16 %	How often would you travel within Australia for leisure related pur	poses?			
Above 65	199	25 %	1–3 times per year	520	64 %		
Prefer not to respond	0	0 %	4–5 times per year	126	16 %		
Education level			>5 times per year	59	7 %		
Less than High School	22	3 %	Never	103	13 %		
High School	179	22 %					
TAFE/Trade	218	27 %	How often would you travel overseas for leisure related purposes?				
University Degree	241	30 %	1–3 times per year	465	58 %		
Post-Graduate University Degree	146	18 %	4–5 times per year	31	4 %		
Prefer not to respond	2	0 %	>5 times per year	11	1 %		
Income			Never 301 37 %				
Less than \$50,000	ss than \$50,000 212 26%						
\$51,000-\$80,000	149	18 %	Have you had COVID-19, or have you been considered as a "close co	ontact" of someone v	vho has had		
\$81,000-\$120,000	188	23 %	COVID-19				
\$121,000-\$150,000	89	11 %	Yes	45	6 %		
\$151,000 and above	108	13 %	No	763	94 %		
Prefer not to respond	62	8 %					
			Willingness and probability of cruising	M	SD		
			(7-point scale, low to high)				
			Willingness to take a cruise in the next 12 months	2.79	2.17		
			Willingness to take a cruise in the next 3 years	3.43	2.28		
			Probability of taking a cruise in the next 12 months	2.40	1.91		
			Probability of taking a cruise in the next 3 years	3.31	2.22		

Tendency to cruise across experimental conditions.

Experimental condition	Total	No-choice option		
	choices	Alternatives not acceptable (ASC1)	Would not travel (ASC2)	
Scenario One: (baseline) – There is a Vaccine Scenario 2: COVID-19 is still around but under control Scenario 3: There has been a resurgence of COVID-19 in Australia Scenario 4: Outbreaks continue in Australia and there has been reported cases on cruise ships	1953 1710 1791 1818	207 (10.6 %) 149 (8.7 %) 143 (8.0 %) 173 (9.5 %)	650 (33.3 %) 462 (27.0 %) 796 (44.4 %) 781 (43.0 %)	

annum and about half had been on a cruise holiday at least once, and of those the most had cruised 1–3 times. Most respondents travel 1–3 times per year domestically, and over half travel internationally 1–3 times per year. Willingness to cruise within the next 12 months is significantly lower compared to within the next 3 years ($M_{<12month} = 2.79$ vs M_{1-3} years = 3.43, t = -13.341, df = 807, p < .05). Likewise, respondents' self-reported likelihood of cruising in the short term is significantly less than in the long term ($M_{<12month} = 2.40$ vs M_{1-3} years = 3.31, t = -18.783, df = 807, p < .05).

The socio-demographic characteristics of respondents who have cruised are representative of industry trends, which is that they are from an older demographic, have a higher income, and higher perceived risks. Specifically, the 65+ age bracket accounts for about one third of those who have cruised (n = 115) whilst all other brackets each accounted for <20 % of cruisers. Among non-cruisers, all age brackets are equally represented. Just over half of those who had cruised had incomes above \$81,000 (n = 199), whilst non-cruisers this income bracket proportion was about 43 % (n = 186). There is a balanced gender split within cruisers (females = 50 %), but within non-cruisers females represent 60 % of respondents. To account for differences between these groups, an interaction term is specified in the model that models travellers preferences for cruise packages across this different subsamples.

Frequency analysis and scale reliability testing

In the lowest risk scenarios, most responses were for cruise packages whereas in scenarios three and four over half of all responses were for a no-choice option.

A confirmatory factor analysis was performed using AMOS 27 to assess the scales adopted from previous studies. All of our adapted scales were measure on 5-point scales and all achieved composite reliabilities being above 0.7, except for risk taking propensity, and all average variance extracted being above 0.5. Risk taking propensity had one item removed from the original scale due to a low beta value. Table 3 lists the Cronbach's α , CR and AVE for each measurement scale.

Choice models

Three choice-based conjoint models were estimated and compared for their relative model fit, including a conditional logit model without any interactions, a model with risk scenario interactions but without the Protection Motivation Theory scales, and a third model that includes interactions with the No-Choice option and the risk scenarios, the dimensions of Protection Motivation Theory, demographics, and previous cruise experience. The third model (M3 reported in Table 4 below) fits best to the data on both Akaike information criterion (AIC) and Bayesian information criterion (BIC) measures compared to the first baseline models and offers the most behaviourally rich interpretations, hence we present the coefficients from this model. The practice of using comparative model fit statistics in choice modelling is supported by Hess et al. (2020).

Aggregate Cruise Package Attribute Preferences across all four conditions

The traditional cruise package features which travellers have significant preferences for are smaller ship sizes ($b_{2000+passengers} = -0.774$, SE = 0.098, p < .001), exterior cabins ($b_{Ocean View Room with Balcony} = 0.688$, SE = 0.090, p < .001), and lower prices ($b_{Price} = -0.003$, SE = 0.001, p < .05). Travellers were indifferent towards different trip lengths or different types of bonus inclusions. From among the COVID-19 specific attributes, free COVID-19 medical treatment and/or having rapid testing available were preferred over having ventilators onboard ($b_{Ventilators on board} = -0.369$, SE = 0.092, p < .001), and a fully refundable cancellation policy ($b_{100\% refund} = 0.218$, SE = 0.090, p < .05). Travellers were indifferent to what mix of COVID-19 precautions were used.

Cruising preferences when exposed to varying levels of COVID-19 risk

The interpretation of the coefficients in Table 5 under each of the scenarios are in comparison with the aggregate (baseline) data. For Scenarios 2 and 3, there were no significant differences in pattern of preferences relative to the baseline, except for some difference in consumers' likelihood to choose a no-choice option in scenario 2 ($b_{ASC1: Would travel, but none of the options suitable = -4.063$, SE = 1.077, p < .001). In Scenario 4, which is the highest risk scenario, the provision of on-board credit or free room upgrades increase consumers likelihood of choosing a cruise package ($b_{Kids Cruise Free} = -0.315$, SE = 0.148, p < .05). Further,

Confirmatory factor analysis results.

Measurement Scale	Beta	$_{\alpha}^{Cronbach's}$	CR	AVE
Willingness to Cruise		0.95	0.80	0.80
My willingness to take a cruise in the next 12 months	0.86			
The probability that I would take a cruise in the next 12 months is	0.83			
My willingness to take a cruise in the next 3 years	0.96			
The probability that I would take a cruise in the next 3 years	0.96			
Risk Taking Propensity		0.69	0.70	0.50
I don't like to take risks compared to most people I know	0.68			
I have no desire to take unnecessary chances on things	0.79			
Perceived Severity		0.87	0.90	0.70
If I were to contract COVID 19 while taking a cruise it would have serious negative consequences on my travel experience	0.79			
Contracting COVID 19 would have a severe impact on my trip	0.87			
If I were to contract COVID 19 during the cruise, it would be harmful to my well-being	0.84			
Perceived Vulnerability		0.89	0.90	0.70
My chances of contracting COVID 19 on a cruise ship are extremely high	0.85			
I am at risk of being exposed to COVID 19 when taking a cruise	0.88			
It is likely that I will be exposed to COVID 19 whilst taking a cruise	0.82			
Self-Efficacy		0.89	0.90	0.60
How confident are you in your ability to perform the following behaviours to protect yourself from COVID-19 should there				
be an outbreak on your cruise				
Self-isolating in my cabin as much as possible	0.69			
Physically distancing myself from others	0.70			
Washing hands and using hand sanitiser consistently	0.80			
Wearing a mask	0.82			
Following instructions, abiding by rules	0.85			
Avoiding public spaces and crowded places (swimming pools, gym, cinemas, restaurants)	0.79			
Limit my time indoors	0.60			
Response Efficacy		0.92	0.90	0.60
Please indicate how effect you believe these actions would be in protecting yourself against COVID-19				
Self-isolating in my cabin as much as possible	0.75			
Physically distancing myself from others	0.83			
Washing hands and using hand sanitiser consistently	0.83			
Wearing a mask	0.81			
Following instructions, abiding by rules	0.85			
Avoiding public spaces and crowded places (swimming pools, gym, cinemas, restaurants)	0.83			
Limit my time indoors	0.64			
Protection Motivation		0.91	0.90	0.60
Please indicate how likely you would be to engage in these behaviours to protect yourself from COVID-19				
Self-isolating in my cabin as much as possible	0.77			
Physically distancing myself from others	0.85			
Washing hands and using hand sanitiser consistently	0.76			
Wearing a mask	0.81			
Following instructions, abiding by rules	0.80			
Avoiding public spaces and crowded places (swimming pools, gym. cinemas, restaurants)	0.83			
Limit my time indoors	0.59			

those willing to travel in the highest risk scenario prefer having either a tracing app and/or increased cleaning in common areas over having security onboard to enforce COVID-19 safety precautions ($b_{\text{Security onboard for compliance}} = -0.290$, SE = 0.139, p < .05).

Protection motivation and demographic impacts on opt-out behaviour

The five dimensions of protection motivation were included in the model as interaction terms to assess respondents' risktaking propensity, perceived vulnerability, perceived threat severity, response efficacy and self-efficacy impacted their likelihood to select a no-choice option.

Risk taking propensity

This dimension is important in Scenario 2. Those with a higher propensity to take risks were more likely travel, but not select one of the options presented in the choice tasks ($b_{\text{Risk Taking Propensity} \times ASC1 = -0.703$, SE = 0.161, p < .001). As the level of risk increases in Scenarios 3 and 4, travellers with low risk taking propensity are more likely to opting out of travel completely ($b_{\text{Risk Taking Propensity} \times ASC2 = -0.856$, SE = 0.105, p < .001; $b_{\text{Risk Taking Propensity} \times ASC2 = -0.534$, SE = 0.107, p < .001).

Model catalogue and fit statistics.

Model	Parameters	LL	AIC	BIC
M1 Conditional Logit	16	-10,628.17	21,288.34	21,424.36
M2 Conditional Logit – Risk Level interactions included	64	-10,514.27	21,156.55	21,700.62
M3 Conditional Logit - Risk Level, Protection Motivation Theory and Other interactions included	149	-9152.26	18,576.51	19,732.68

Perceived vulnerability

Overall, travellers with higher levels of perceived vulnerability were more likely to select a no-choice option ($b_{\text{Perceived Vulnerability} \times ASC1} = 0.358$, SE = 0.106, p < .001; $b_{\text{Perceived Vulnerability} \times ASC2} = 0.933$, SE = 0.085, p < .001) but as the risk levels increase, we see a sign reversal on this dimension, indicating those with higher perceived vulnerability are more likely to cruise.

Perceived severity

This dimension had no impact on preferences to cruise. This might explain why those with higher perception of vulnerability are willing to cruise in the higher risk settings (i.e., they anticipate a risk, but do not anticipate significantly high levels of severity).

Response efficacy

Overall, travellers who trust in the efficacy of COVID-19 safety strategies implemented by the cruise operator are more likely to travel ($b_{\text{Response Efficacy} \times \text{ASC1} = -0.925$, SE = 0.128, p < .001; $b_{\text{Response Efficacy} \times \text{ASC2} = -0.452$, SE = 0.097, p < .001), but we again see a sign reversal across the scenarios that suggests the response of cruise operators is an important predictor of whether or not travellers will decide to cruise.

Self-efficacy

Travellers with higher levels of confidence in their own ability to protect themselves are more likely to cruise in higher risk scenarios. This effect is particularly strong in Scenario 4, highest risk scenario, in which the parameters for both the ASC1 and ASC2 are significant and negative ($b_{Self Efficacy \times ASC1} = -0.508$, SE = 0.197, p < .05; $b_{Self Efficacy \times ASC2} = -0.473$, SE = 0.144, p < .001). This may in part account for travellers' disutility for security onboard to enforce safety measures.

Protection motivation

This dimension captured respondents' likelihood to follow COVID-19 safety protocols, but it shows no significant impact on travellers' preferences to cruise in any scenario.

Individual level covariates

Interaction effects for age, gender, income, and cruise experience were only estimated on the aggregate data due to limits on the number of identifiable parameters. For age, the two oldest cohorts are about twice as likely not to travel relative to younger demographics ($b_{Age\times ASC2}$ (65+ years old) = 1.100, SE = 0.191) and are also the most price sensitive ($b_{Age\times Price}$ (\$300 per day) = -1.107, SE = 0.189). Gender and income had no significant effects, but past cruising experience had a strong negative interaction with the no-choice option indicating that those with prior cruising experience were more likely to select a cruise package (b_{Cruise} Experience×ASC2 = -1.562, SE = 0.065).

Discussion

Our findings suggest that for Australian travellers are still willing to cruise irrespective of the pandemic. Aligning with previous studies that explore the influence of past travel experience on sentiment towards travel during or following a crisis (e.g., Holland, Mazzarol, et al., 2021a; Walters et al., 2015), our study found that regular cruisers are a dependable market during COVID-19. For example, while those who had cruised previously are likely to delay cruising for at least 3 years, regular cruisers reported a stronger propensity to cruise within a 12-month period. Consistent with the recent works of Holland, Mazzarol, et al. (2021b), Ivanova et al. (2021) and Pan et al. (2021), we find that the provision of COVID-19 medical options and safety on board is paramount to the market regardless of the risk status of the pandemic. Overall, specific attributes selected to reduce the risks associated with cruising during a pandemic included smaller ship size (i.e., <2000 passengers), exterior rooms with a balcony, free medical treatment, and availability of Rapid Antigen Testing. Travellers were indifferent towards bonuses and trip duration. In terms of financial risk, prospective cruisers opted for a full refund policy over a credit or a 50 % credit, 50 % refund option. Our findings also indicate a demographic shift among traditional cruisers with older cohorts being less likely to cruise. This finding resonates with that of Holland, Weeden, et al. (2021) and Pappas (2021) whose studies both revealed that older segments felt more at risk and more vulnerable to COVID-19 compared with younger cohorts. Older segments in our study also proved to be more price sensitive.

We found some differences in preferences among those that indicated a willingness to cruise. Responsiveness to bonuses and financial incentives are consistent with Pan et al.' (2021) research revealing that safety and pricing are top of mind for those considering cruising during the pandemic. As COVID-19 increases consumers' core underlying preferences for the features of a cruise

Model 3 results.

Cruise Package Attribute	Aggregate Means, including							
Preferences Scer a Va (bas n =		cenario 1: There is Vaccine baseline) = 217		Scenario 2: COVID-19 is still around but under control n = 190		enario 3: There has been a surgence of COVID-19 in Istralia = 199	Scenario 4: Outbreaks continue in Australia and there has been reported cases on cruise ships n = 202	
Ship Size <1000 passengers	-		-		-		-	
(baseline) 1000–2000 passengers 2000 + passengers Length of Trip	$-0.234^{**}(0.082)$ $-0.774^{***}(0.098)$ 0.007(0.009)		-0.209 (0.117) 0.028 (0.137) -0.003 (0.013)		0.060 (0.122) 0.012 (0.145) -0.006 (0.013)		0.009 (0.122) -0.017 (0.147) 0.014 (0.013)	
Bonuses	0.00	(0.000)	0.003 (0.013)					
\$150 onboard credit (baseline)	-	0 (0 000)	-		-	102 (0.120)	-	
Kids cruise free	0.09	9 (0.092) 4 (0.099)	0.017 (0.130) -0.111 (0.142)		0.192 (0.136) 0.060 (0.147)		-0.041(0.136) $-0.315^{*}(0.148)$	
Interior (baseline)	_		_		_		_	
Exterior Ocean View Room with Balcony	0.38 0.68	9 ^{***} (0.106) 8 ^{***} (0.090)	-0.224 (0.151) -0.132 (0.127)		-0.181 (0.158) -0.004 (0.134)		0.001 (0.157) -0.153 (0.135)	
COVID-19 Precautions Tracing App (baseline)	-	6 (0.095)	- _0	015 (0 135)	-		- -0.290* (0.139)	
compliance Increased cleaning of	0.00	6 (0.095)	0.096 (0.133)		-0.030 (0.142)		-0.244 (0.140)	
rooms and common areas COVID-19 Medical								
Free COVID-19 Medical Treatment (baseline)	-		-		-		-	
Ventilators on board Rapid COVID-19 testing	-0.3 -0.1	-0.369 ^{***} (0.092) -0.142 (0.087)		-0.042 (0.131) -0.020 (0.124)		118 (0.136) 0.100 (0.131)	0.095 (0.138) 0.206 (0.130)	
Cancellation Policies	_		_		_		_	
50 % credit +50 % refund	-0.2	246* (0.101)	0.18	38 (0.143)	0.0	064 (0.149)	-0.014 (0.151)	
100 % refund Price	0.21 -0.0	8 [*] (0.090) 003 [*] (0.001)	0.045 (0.129) 0.000 (0.001)		-0.216 (0.134) 0.001 (0.001)		0.033 (0.135) 0.000 (0.001)	
ASC1: Would travel, but none of the options	0.89	5 (0.724)	-4.063**** (1.077)		-1.259 (0.945)		-0.017 (0.888)	
ASC2: Would not travel	-4.8	828*** (0.668)	0.646 (0.843)		-0.449 (0.743)		0.968 (0.733)	
Interactions between Not Aggregate Means, including								
Motivation Theory		Scenario 1: The is a Vaccine (baseline) n = 217		re Scenario 2: COVID-19 still around but under control n = 190		Scenario 3: There has been a resurgence of COVID-19 in Australia n = 199	Scenario 4: Outbreaks continue in Australia and there has been reported cases on cruise ships n = 202	
Risk Taking Propensity × ASC1 Risk Taking Propensity × ASC2 Perceived Vulnerability × ASC1 Perceived Vulnerability × ASC2 Perceived Severity × ASC1		SC1 0.156 (0.093) SC2 0.086 (0.071)		-0.703^{***} (0.161) -0.157 (0.115)		-0.099 (0.150) -0.856 ^{***} (0.105)	0.023 (0.142) -0.534*** (0.107)	
		0.358 (0.10 0.933*** (0.08 -0.089 (0.134	6) 5) 1)	-0.509^{***} (0.148) -0.375^{**} (0.123) 0.074 (0.204)		-0.256 (0.158) -0.584 ^{***} (0.120) -0.003 (0.191)	-0.070(0.158) $-0.375^{**}(0.119)$ -0.327(0.190)	
Perceived Severity × ASC2	2	-0.083 (0.108)		0.115 (0.169)		0.183 (0.148)	0.075 (0.153)	
Response Efficacy \times ASC1 Response Efficacy \times ASC2	fficacy \times ASC1		128) 197)	$\begin{array}{l} 28) & 1.019^{***} (0.210) \\ -0.156 (0.142) \end{array}$		$1.435^{***}(0.241)$ -0.362*(0.147)	$0.629^{}(0.186)$ -0.017 (0.135)	
Self-Efficacy \times ASC1		-0.452 (0.09 0.155 (0.134)		0.143 (0.231)		-1.010^{***} (0.225)	$-0.508^{*}(0.197)$	
Self-Efficacy × ASC2	661	-0.164 (0.102	2)) -0.167 (0.144)		0.115 (0.156)	-0.473^{***} (0.144)	
Protection Motivation × A Protection Motivation × A	ISC1 ISC2	$\begin{array}{cccc} C1 & 0.055 & (0.132) \\ C2 & 0.167 & (0.103) \end{array}$		-0.455 (0.249) 0 193 (0 172)		0.104 (0.234) 0.157 (0.158)	0.341 (0.206) 0.185 (0.158)	
Note: Standard errors in p *p < .05, **p < .01, ***p <	oarentl .001	heses, scenario c	oeffic	cients are interpreted as	s dif	ferences relative to aggregate	means	

Interactions between not cruising and individual level covariates

Aggregate means, includes all scenarios N = 808

(continued on next page)

Table 5	(continued)
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Interactions between not cruising and individual level covariates	Aggregate means, includes all scenarios $N=808$
Age \times ASC2 (18–25 year old - baseline)	-
Age \times ASC2 (26–35 years old)	0.612** (0.201)
Age \times ASC2 (36–45 years old)	0.697** (0.213)
Age \times ASC2 (46–55 years old)	0.842*** (0.202)
Age \times ASC2 (56–64 years old)	1.147*** (0.199)
Age \times ASC2 (65+ years old)	1.100*** (0.191)
Age \times Price (18–25 years old - baseline)	
\$100 per day	-
\$200 per day	-
\$300 per day	-
Age \times Price (26–35 years old)	
\$100 per day	0.175 (0.195)
\$200 per day	0.016 (0.198)
\$300 per day	0.231 (0.192)
Age \times Price (36–45 years old)	** .
\$100 per day	0.545** (0.204)
\$200 per day	0.344 (0.208)
\$300 per day	0.243 (0.203)
Age × Price (46–55 years old)	
\$100 per day	-0.356 (0.202)
\$200 per day	$-0.601^{++}(0.206)$
\$300 per day	$-0.758^{+++}(0.204)$
Age × Price (56–64 years old)	***
\$100 per day	-0.820^{***} (0.204)
\$200 per day	$-0.829^{++}(0.209)$
\$300 per day	-1.029 (0.206)
Age \times Price (65+ years old)	0.012*** (0.100)
\$100 per day	-0.912 (0.189)
\$200 per day	-1.110 (0.194)
\$300 per day	-1.107 (0.189)
Gender × ASC2	-0.091(0.062)
Income × ASC2	0.015 (0.020)
CIUISE EXPERIENCE × ASC2	-1.002 (0.000)
Note: Statidard errors are in parentileses, individual level coefficients are computed on aggregate sample. *p < 0.05, $**p < 0.01$, $***p < .001$.	

package do not differ much from those chosen in response to a scenario where COVID-19 is under control. However, the decision to opt in or out of cruising does differ significantly across the four conditions. We explored this further by integrating the dimension of Protection Motivation Theory to better understand the risk related reasoning behind the decision.

Our findings align with recent studies (e.g., Bhati et al., 2021; Hsieh et al., 2021; Quintal et al., 2021; Yuen et al., 2021; Zheng et al., 2021) that establish the relevance of Protection Motivation Theory in examining tourist behaviour in the COVID-19 era and more broadly self-protection from health-related risk. When looking into the psychology of risk, those with a higher propensity to take risks were less likely to opt out of cruising, irrespective of how severe the risk became. However, with increased risk in Scenarios 3 and 4, travellers with low risk taking propensity were more likely to opt out of travel completely. With reference to the Protection Motivation Theory framework, our study revealed that those who felt they were more vulnerable to contracting the virus while cruising were less likely to opt out as the risk intensified. Possible explanation for this counter intuitive result lies in the work of Wolff et al. (2019) that suggests worry is a more reliable predictor of risk -taking behaviour. Wolff et al.'s proposition would imply that just because tourists felt vulnerable to the risk of contracting COVID doesn't mean they were worried by it - hence their willingness to still cruise as the risk intensified. Those with a higher level of confidence in their ability to follow and comply with protection strategies to prevent the spread of COVID-19 may not be deterred as much in higher risk scenarios. In Scenario 4 our results show strong aversion towards Security on board for compliance, further suggesting travellers prefer and have confidence in managing their own levels of risk. Those who felt the severity of the risk was high and those who were more likely to engage in self-protection did not show any differences in their likelihood of travel across the four scenarios, again demonstrating some level of risk tolerance among prospective cruisers. This is contrary to findings revealed by Holland, Mazzarol, et al. (2021b) that indicated a reluctance to cruise during the COVID-19 era, however the authors did suggest that the introduction of health and safety measures, such as those proposed in this study could entice crusie travel. Our findings are supported by recent research into travel and COVID-19 by Zheng et al. (2021) who revealed that people who have protection motivation are more willing to choose cautious travel rather than travel avoidance. Baker and Stockton (2013) also found that while cruisers perceive there to be significant health risks with this type of holiday, they do tend to take more precautions to help mitigate the risk. This study revealed that travellers' trust in the cruise provider's efficacy in providing COVID-19 safety measures was an important predictor of cruising across all the COVID-19 risk scenarios, suggesting that safety response was critical in

attracting cruisers. In terms of demographics, age and previous cruise experience predicted cruise choice, with younger travellers twice as likely to cruise than older travellers, and experienced cruisers more likely to choose a cruise option than inexperienced cruisers. Income did not influence respondents' decision to cruise. This finding contrasts with Quintal et al.'s (2022) research that suggested government policy may potentially overshadow any risk mitigation attempts by cruise lines to instil trust among consumers during the pandemic.

Contribution to theory

Theoretically, our research confirms and extends prior research adopting Protection Motivation Theory in tourism research and in particular travel during COVID-19 (e.g., Wang et al., 2019; Zheng et al., 2021) to a cruise context. Our research departs from the plethora of COVID-19-focussed tourism research by examining how prospective cruisers are likely to respond to and manage the risks that cruising presents across four different COVID-19 scenarios. By using a choice modelling method that directly assesses consumer preferences for specific cruise features and risk mitigation strategies, our research suggests there is an element of crisis resistance in the Australian cruise market. The application of choice modelling has enabled the researchers to assess travellers' preferences for the features of cruise packages. Such insight not only deepens our theoretical understanding of how the current pandemic, or future pandemics will influence travel preferences at different levels of severity, but also informs relevant marketing and risk mitigation approaches for the cruise industry under evolving conditions typically manifested by pandemic. This methodological contribution addresses a previously identified gap related to the majority of prior research adopting cross-sectional or qualitative studies and is one of the first studies to test Protection Motivation Theory relevance in a cruise context.

Practical implications

Our research also provides much needed evidence of cruise consumer preferences to inform the cruise industry and cruise destinations for their current recovery strategies. By eliciting preferences, the industry can be practically and reliably guided in relation to optimal marketing communications and product offerings to limit perceived risk and incentivise cruise travel. For example, advertising campaigns which integrate images and promotions of smaller cruise ship options, younger travellers, and outside rooms with COVID-19 safety and cancellation refund guarantees are recommended to appeal to a younger, less risk averse segment. Loyalty programs should be mined to leverage experienced travellers who appear to exhibit less reluctance associated with self-protection and perceived pandemic risk, as the most cost-effective target segment during COVID-19 recovery in the short term. Incentives through promotion and more elaboration in relation to COVID-19 safety measures should also be targeted towards inexperienced cruise travellers, and an agile marketing and promotional strategy is recommended to effectively respond to the market as pandemic risk changes over time, warranting differing strategies to meet perceived risk and protection needs of the market and particular segments. With these identified features included in the packages, there is potential for cruise operators to increase price and yield to meet these new norms for consumer preference.

Our research reveals that cruising remains an option for specific segments, such as younger consumers and previous cruisers, who are more confident of their ability to manage their own levels of risk independently. Hence, we recommend that pricing strategies consider safety and quality over low-cost deals aiming for high yield over high occupancy. This strategy will enable ships to sail with less passengers on board that in turn will allow for social distancing. While the older generation of traveller may have been a popular and responsive segment for the cruising industry in pre-COVID-19 times, it is suggested that Cruise companies diversify both their product and market focus in the short term. We recommend that Cruising companies target younger cohorts who are well travelled and are perhaps looking to substitute their overseas travel adventures with a local cruise itinerary. Our data also suggests a need for cruise operators to ensure offerings exhibit and deliver lower crowd density, COVID-19 cleaning in common areas and on-board contact tracing. In terms of the most feasible target segments, if COVID-19 persists, younger and experienced cruisers who are less risk averse and show lower price sensitivities are likely to be more responsive than older segments. Features for cruise product bundling include prioritisation of fully flexible cancellation and effective health compliance policies on board to enable cruisers to engage in protective behaviour and keep themselves safe from the virus. With society becoming more confident with travel more broadly in parallel to virus becoming more endemic, the cruise industry can consider reducing some measures commensurate with our findings relating to different COVID-19 risk levels. Longer term, with inevitable risk of further pandemics, our research provides practical guidance to the industry on the likelihood of consumer response to cruise packages and incentives to reduce barriers to travel associated with perceived risk. With the cruise market increasingly concerned about its impacts upon environmental sustainability and social licence to operate (e.g., de Almeida Ramoa et al., 2019), our findings relating to health-related pandemic risk may align with future sustainability strategy to reduce cruise size and footprint.

Limitations and future research

Some limitations to our research are noted, including the Australian sample and the 2021 timing of our data collection, during the early stages of pandemic recovery, as Australia was experiencing international border lockdown. Further replication and extension of our findings adopting choice modelling methodology is warranted through testing of additional cruise and health features implemented since our study, including vaccine passports, mandatory testing pre and during cruise and perceived destination safety. Additional modelling of brand dimensions such as trust, prominence and sustainability would also be of interest in

predicting consumer choice, and their interaction with the patterns we have found in this initial study. While our research provides useful causal data to predict likely cruise consumer preferences in different risk scenarios, longitudinal replication and studies are needed as industry recovery evolves. Qualitative research is also a worthwhile research direction, to gain richer insights into different segments' behaviours and motivations to travel on a more granular level. For example, pre- and post- cruise interviews, observational data during cruise in collaboration with the cruise industry and field experiments would all be useful future research investigations.

CRediT authorship contribution statement

Gabby Walters: Team lead, conceptualisation of the study, literature review and discussion, conclusion, proof reading and editing.

Ann Wallin: Co- Design of the choice experiment, proof reading and editing, methodology write up

Thomas Magor: Co-design of the choice experiment, data analysis, results write up, editing

Sarah Kelly: Contribution to the conceptualisation of the research, industry liaison and consultation, editing and proof reading, contributed to discussion and conclusion.

Appendix. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.annals.2022.103499.

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Gabby Walters is an Associate Professor in Tourism at the University of Queensland. Her research interests lie in crisis and disaster recovery, namely marketing communications and image management. She also holds significant expertise in experimental research that focuses on neurological and psychophysiological measurement. **Thomas Magor** is a lecturer in Marketing with the UQ Business School. He is highly experienced in Choice Modelling and his research interests include marketing, tourism and transport. Thomas has published in Journals such as the Journal of Choice Modelling and Frontiers in Psychology.

Sarah Kelly is an Associate Professor in Law and Marketing at the University of Queensland. She is globally known for her research, speaking and consulting in the sports field and is also co-leading a research hub at UQ in Trust, Ethics and Governance. Sarah is a visiting fellow at Loughborough University Institute of Sport, London and OP Jindal University, Delhi. Her current research projects are focused upon esports, women's sport, sports integrity and mega-event legacy.

Ann Wallin is a Lecturer in Marketing UQ Business School and researchers a variety of topics: consumer decision making; brand signalling and portfolio strategy; and marketing education. Her interdisciplinary research has been published in leading journals such as Decision and Journal of Travel Research, and presented globally at ISMS Marketing Science and International Choice Modelling conferences.