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Cruise passengers' risk reduction strategies in the wake of COVID-19

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Abstract

The COVID-19 pandemic devastated the cruise sector with an initial global shutdown and ongoing patchy resumption, widespread reporting of virus transmission onboard and billions of dollars in economic losses. This study explores how COVID-19 has impacted Australian and UK consumers' risk perceptions, revealing cruises are no longer considered 'safe'. Consumers are more negative about, and less willing to, cruise. Cluster and Leximancer analyses identified five distinct market segments differentiated by the extent of travel risk they perceived. Specific risk reduction strategies are identified and include risk mitigation, use of risk relievers, and risk avoidance.

Key words: Risk, tourism, risk reduction, cruise ship, COVID-19, cruise passengers, tourist decision-making, Australia, United Kingdom, cluster analysis

Introduction

The COVID-19 pandemic devastated global tourism, with the cruise sector particularly affected. The pandemic had significant impact on ocean cruising as cruise operations were suspended for months with multi-billion-dollar financial losses, the shedding of tens of thousands of jobs, with some cruise lines going out of business, others restructuring and refinancing and the sale of ships (Cruise Lines International Association [CLIA], 2020a; Levin, 2020). The largest corporation, Carnival Cruise Lines, had to secure an investment loan of $26.3bn after losses of $10bn (BBC, 2021). The cruise sector was particularly affected due to high infection rates among crew and passengers (Mizumoto & Chowell, 2020; Rocklöv et al., 2020), and experienced unprecedented cancelations and economic losses (Chen et al., 2021). Thousands of passengers were stranded onboard, as cruise ships were held in quarantine or refused entry to ports as borders closed. Prior to the pandemic, the cruise sector had experienced robust growth and 2020 should have been a record year, with 32 million passengers expected to sail (CLIA, 2019b).

Cruise ships have been negatively associated with COVID-19 after a large cluster of cases were confirmed onboard several ships, including the *Diamond Princess,* the *Ruby Princess,* and the *Grand Princess* (Ito et al., 2020). There were at least 700 confirmed cases of COVID-19 on the *Diamond Princess,* which related to 14 deaths (Leffler & Hogan, 2020). Globally, more than 50 cruise ships reported confirmed cases of COVID-19, with at least 83 deaths (Dolven et al., 2020). In Australia, risk perceptions were particularly affected by the saga of the *Ruby Princess,* which would be linked to more than 1221 cases and 28 deaths (Davies et al., 2020; Walker, 2020).

Prior to 2020, Australia was performing strongly in the cruise travel sector, as cruising had become the country's fastest growing tourism sector (CLIA Australasia, 2018). Australia had a higher market penetration than the rest of the world and was the only passenger source market in which 1 in 17 people had cruised (CLIA, 2019a; CLIA Australasia, 2018) with 1.35 million Australians cruising in 2019 (CLIA, 2020c). Industry reports estimated the contribution of the cruise sector to the Australian economy was worth $5.2 billion in 2018 and was an increase of 11% from the previous financial year (CLIA, 2019b). The Australian government ceased all cruise travel from March 2020 and it was anticipated there would be no resumption of cruising in Australian waters before 2022 at the earliest, with officials continuing to advise cruise travel posed an unacceptable public health risk (Holland et al, 2021; Seatrade Cruise News, 2021a).

The UK had also enjoyed increasing demand for cruising, with more cruise lines operating in that region. In 2019 a record two million passengers cruised from the UK and Ireland, making this the third largest passenger source market after the United States and Germany (CLIA, 2020c). Significantly, the UK represents 28% of cruise passengers in Europe (Business Research & Economic Advisors [BREA], 2019) and generated £10 billion for the UK economy in 2019 (BREA, 2020). The UK ceased cruise operations in March 2020 and restarted at a reduced capacity in May 2021 (Seatrade Cruise News, 2021b). Cruise lines operating in the UK must follow stringent protocols developed by the UK Chamber of Shipping and CLIA (UK Chamber of Shipping, 2021). Australia and the UK were selected as research sites due to the significant impact of the pandemic on the cruise sector in these regions.

The COVID-19 pandemic highlights potential risks involved in travel, and how risk perceptions, whether real or imagined, can significantly impact travel decisions (Chen at al., 2021; Mizrachi & Fuchs, 2016). Understanding how tourists manage risk is important as perceived risk influences travel decisions including destination choice, travel intentions, information search and pre-purchase behaviour (Fuchs & Reichel, 2011; Kim et al., 2016; Quintal et al., 2010; Reisinger & Mavondo, 2005; Yang & Nair, 2014). This issue is particularly important, as travel products are risky due to their intangibility, high cost and complexity (Lin et al., 2009*)*, vulnerable to crises and disasters (Chen et al., 2021) with many researchers acknowledging that risk is an unavoidable part of travel (Williams & Baláž, 2013; Yang et al., 2017).

Tourists, as consumers, develop strategies to reduce risk and manage uncertainty to a tolerable level (Bauer, 1960; Mizrachi & Fuchs, 2016). However, there is a gap in our understanding of how risk perceptions influence cruise decision-making, with scholars calling for more research on this topic (Holland, 2020; Le & Arcodia, 2018), particularly in relation to risk-reduction because of COVID-19 (Quintal et al., 2021).

More research is needed to better understand how COVID-19 may have changed how risk is perceived and managed when people consider a cruise holiday. Studies are emerging addressing this important topic, including work by Quintal et al. (2021) and Yuen et al. (2021) examining the impact of COVID-19 on cruise travel. Potential cruisers need to consider aspects such as health protocols, outbreak prevention plans, onboard cleaning procedures, social distancing measures and health screenings prior to boarding. Additionally, potential cruisers may need to consider implications of possible outbreaks during a cruise, which may result in them being quarantined in their cabin. Cruises may be terminated should there be an outbreak on the ship or in the region that the cruise ship is visiting, resulting in a need to return home

suddenly. All of this adds to the complexity and uncertainty associated with the decision to cruise and what actions can be taken to mitigate the risks involved. Consequently, the present study was undertaken to investigate how risk perceptions of ocean cruising have changed because of the pandemic, to identify risk reduction strategies cruisers might use to manage risk.

Literature review

Tourists' risk perceptions are influenced by preference for familiarity or novelty (Cohen 1972; Lepp & Gibson, 2003; Reichel et al., 2007; Wang et al., 2019), chronological or cognitive age (Amatulli et al., 2015; Guido et al., 2014), subjective knowledge (Perpiña et al., 2021) and travel experience (Karl et al., 2020; Morakabati et al., 2012; Roehl & Fesenmaier, 1992). There has been debate about whether gender influences risk perceptions (Jordan & Gibson, 2005; Lepp & Gibson, 2003; Lie et al., 2020; Yang et al., 2017), with results being inconclusive. An individual's tolerance level for risk may also be influenced by their national culture (Fuchs & Reichel, 2004; Kozak et al., 2007), social status, educational level, motivation, or personality attributes (Breakwell, 2014; Hasan et al., 2017; Korstanje, 2011; Le & Arcodia, 2018) or prior travel experience (Bowen et al., 2014; Kozak et al., 2007). Other factors seem to be biological in origin, such as DNA or neural chemistry (Ropeik, 2004), or external including physical and ideological contexts (Breakwell, 2014; Douglas & Wildavsky, 1982; Korstanje, 2011). However, past research has been very limited in relation to tourists' risk perceptions of ocean cruising. Such research seems particularly important at this time, as the cruise sector has, arguably, been devastated by the COVID-19 pandemic.

Le and Arcodia (2018) are, to date, the only researchers to develop a framework for investigating risk perceptions for cruise passengers. The framework identified five cruise-related risks: infection outbreaks, sexually transmissible infections, motion sickness, cruise accidents, and terrorism, piracy, crime. Holland (2020) explored cruiser and non-cruiser' health and safety risk perceptions of cruising; finding that perceived risk influenced tourist decision-making. In that study, non-cruisers perceived more risk of getting sick onboard, while cruisers reported developing strategies to minimize getting sick, such as handwashing. Overall, both cruisers and non-cruisers perceived a cruise as a safe holiday but worried about health aspects.

Liu-Lastres et al. (2019) investigated customer responses to communication given by a cruise line about a theoretical norovirus outbreak, specifically looking at how communication influenced information search behaviour, safety perceptions and cruise travel intentions. They found effective and accurate information helped passengers feel safer and better able to cope

with a potential outbreak. Their study also highlighted the importance of tailoring messages to different audiences and suggested emotion affected how messages were interpreted.

Risk handling

If an individual consumer's risk tolerance is surpassed, the consumer will abandon the purchase or take steps to mitigate the risk in purchasing a service or product (Li et al., 2020; Mitchell, 1999; Roselius, 1971; Taylor, 1974; Wai, 2019). Risk reduction strategies include the use of risk relievers, risk mitigation and risk avoidance. A risk reliever is a device or action, initiated by a buyer or seller, used to reduce risk by decreasing the probability the purchase will fail or to shift the perceived loss to a level tolerable for the consumer (Roselius, 1971). Examples of this include choosing well-known brands, preferencing brands used in the past, selecting products tested by government, recommended by friends or family, or endorsed by a celebrity or expert. Risk mitigation refers to efforts to reduce loss or the consequences of unexpected outcomes (Fang et al., 2014), and can include buying from reputable sources, buying brands that have a money-back guarantee. Risk avoidance refers to purchasing only when certain of the outcome (Quintal et al., 2010).

Tourists' risk handling

Tourists engage in additional risk reduction strategies, such as conducting detailed information searches (Lee et al., 2019; Quintal et al., 2021), using advice from family and friends, consulting those who have experience in relevant destinations and modifying the time spent in each destination (Fuchs & Reichel, 2011; Lin et al., 2009; Lo et al., 2011; Mansfeld et al., 2016; Mizrachi & Fuchs, 2016). To reduce risk they might book through travel agents, travel in groups, book packages, purchase travel insurance or book shorter trips (Chien et al., 2017; Nugraha et al., 2020; Matiza, 2020), get vaccinated and take medical precautions (Yeung & Yee, 2013). The most significant way tourists handle risk is through destination avoidance (Nugraha et al., 2016; Promsivapallop & Kannaovakun, 2018; Quintal et al., 2010; Sönmez & Graefe, 1998). However, an emphasis on destination avoidance fails to adequately explain how tourists manage risk for ocean cruises that may visit several destinations and fails to recognise the complex decision-making involved when choosing a cruise holiday.

Risk handling in ocean cruising

Prior to COVID-19, research on risk reduction strategies in ocean cruise was limited to examining information search (Petrick et al., 2007; De La Vina & Ford, 2001) or brand loyalty. Studies have found cruise passengers often choose the same brand based on previous

experience and familiarity (Hung & Petrick, 2011; Li & Petrick, 2008; Petrick et al., 2007). Research has shown cruise consumers were notable for their loyalty to the cruise experience, with 62% of cruise passengers repeat cruising (see CLIA, 2016; Sun et al., 2018), even after experiencing H1N1 or norovirus outbreaks (Holland, 2020). CLIA (2021) found concerns about COVID-19 had not affected cruisers, with two out of three cruisers saying they planned to cruise again in the next year or two. Other research supports this, noting repeat cruisers have said they feel safe onboard and have confidence in and trust the cruise lines to look after them (Bowen et al., 2013; Holland, 2020). This supports the wider tourist risk literature, which found prior travel experience may influence risk perceptions (see Fuchs & Reichel, 2011; Lepp & Gibson, 2003; Kim et al., 2016; Mansfeld et al., 2016; Sharifpour et al., 2014; Tan & Wu, 2016; Williams & Baláž, 2013). Sharifpour et al (2014) suggested travel experience increased a tourist's cumulative knowledge and added information through experiences, while Sönmez and Graefe (1998) found travel experience to a destination decreased the perception of risk for travel to that destination. Similarly, Henthorne et al. (2013) found first-time cruisers experienced more discomfort ashore than did repeat cruisers. Thus, cruise passengers may perceive less risk when they cruise repeatedly, as they are familiar with cruising and know what to expect.

Prior cruise travel experience may reduce health risk perceptions (Baker & Stockton, 2013; Holland, 2020; Liu et al., 2016). Notable studies include Baker and Stockton's (2013) investigation of health perceptions and responses, suggesting (at that time) that cruise passengers were not concerned about getting sick and finding those who cruised more often took precautions to avoid getting sick. These precautions included consulting with their healthcare practitioners before cruising and taking personal measures to prevent getting sick, providing evidence that past cruise experience impacted risk perceptions. Liu et al. (2016) found cruise passengers' perceived self-efficacy moderated the relationship between the perceived risk of contracting norovirus and the perceived overall safety of cruising. In other words, tourists with more cruise experience take more preventative steps to protect themselves, increasing their confidence in preventing illness while on a cruise. Similarly, Fisher et al. (2018) and Holland (2020) found cruise passengers used handwashing to prevent illness onboard and understood the importance of social distancing to avoid transmission.

While some cruise passengers may book a cruise because of the perceived ease of access to medical care, Klein et al. (2017) pointed out this was not always the case, noting the lack of standardisation in facilities onboard or medical staff, with widely differing levels of medical qualifications (also Dahl & Stannard, 2015). The authors identified wide variation between

what cruise passengers expect and what exists, and the difficulty surrounding liability should something go wrong. There is also increased difficulty in medical evacuations from cruise ships when sailing in remote destinations (Lück et al., 2010; Stewart et al., 2007), which may be of more concern when cruise operations resume after COVID-19. However, the lack of data available in relation to the COVID-19 pandemic suggests more research is needed to determine if, or how, health concerns about cruise holidays have changed, especially considering the many cruise ships that had confirmed cases of the coronavirus onboard.

The impact of COVID-19 on the cruise sector

As the COVID-19 pandemic has had a significant impact on how people perceive health risks in cruising, it provides an opportunity to develop a deeper understanding of how anxiety around health influences cruise choices and, significantly, what steps cruise passengers might take in the future. A gap exists in the literature in identifying how tourists manage the risks of a cruise holiday, particularly health risks, despite several previous infectious outbreaks on cruise ships. Further, little is understood about what specific risk reduction strategies potential cruise passengers employ to manage and mitigate such risks as COVID-19. Thus, research needs to look more deeply into how health anxieties influence risk perceptions and explore how access to medical care might influence cruise decision-making, especially considering COVID-19.

Quintal et al. (2021) is one of the first studies to investigate risk reducing behaviours for cruise tourists in relation to COVID-19, finding health information had a significant positive impact on reducing travel anxiety for some Australian cruisers. A framework was proposed to guide risk communication to establish trust and handle risk, including focusing on competence, consistency, consideration, and conviviality (Renn & Levine, 1991; Quintal et al., 2021).

Further, few studies have examined risk strategies beyond a narrow emphasis on cruisers in the United States, perhaps because this is the largest cruise passenger source market (CLIA, 2020c). Thus, our knowledge is limited, and more research is needed, as there may be differences in risk perceptions and risk reduction methods between regions. For example, Mahadevan's (2016) study found brand reputation and brand loyalty were less important to Australian cruisers, which differs from other studies which found brand loyalty was influential in cruise decision-making (see Ahn et al., 2021; Li & Petrick, 2008). This may be significant as brand loyalty is a risk reliever. An understanding of regional differences is critically important in predicting how cruisers will respond in the aftermath of the COVID-19 pandemic and how risk perceptions will influence future cruise travel decision-making and behaviour. As

different markets begin to restart operations, understanding regional differences will be even more important. Prior research has found evidence of these differences, with Holland et al. (2021) reporting that Australians were more negative about cruising because of COVID-19 in comparison to respondents living in the UK. This may be explained by the more extensive media negative coverage in Australia in relation to the *Ruby Princess* and other cruise-related deaths and passenger-related COVID-19 transmissions.

Similarly, industry research conducted in the UK during the height of the pandemic found 83% of UK travellers aged 50-70 said given enough time and a vaccine they would cruise again. However, a trend is emerging where more cruisers are saying they would not cruise again the longer the pandemic continued (Silver Travel Advisor, 2021). Further, 17% of cruiser respondents indicated they would never ocean cruise again, up from 14% at the start of the research in May 2020 (Silver Travel Advisor, 2020). Other research has also noted the pandemic's negative impact on repeat cruisers' behavioural intentions and willingness to cruise (Radic et al, 2021). The increased perceived risk of cruising is particularly significant, as many cruise tourists are risk averse (Tarlow, 2006) and ensuring a safe and healthy cruise is paramount for the cruise sector (Liu-Lastres et al., 2019).

While research suggests those with more cruise experience may take more actions to prevent illness (Bakerton, 2013; Liu et al., 2016), there is less known about other steps cruise tourists might take to reduce other risks. This is important as the cruise industry seeks to restart operations, highlighting the need to understand how to encourage people to return to cruising and what risk reduction strategies might assist in this transition. These issues were examined in the present study, which is discussed in subsequent sections.

Methodology

The study used a mixed-method approach in the methodology comprising a large-scale consumer survey with both psychometric scales for quantitative analysis, and open-ended items for qualitative analysis. The following sub-sections outline the methodology followed.

Questionnaire design and data collection

The survey incorporated items from a number of applicable scales, including those focused on perceived overall value, word of mouth, risk avoidance, change and willingness to purchase (see, for example, Quintal et al., 2010; Sweeney & Soutar, 2001; Sweeney et al., 2008). This paper is primarily concerned with cruisers' perceptions of cruise travel risk and their responses to six items adapted and developed from the 15-item travel risk scale presented by Floyd &

Pennington-Gray (2004) and a number of subsequent studies (e.g., Abraham et al., 2021; Choi et al., 2019; Floyd et al., 2004; Schroeder et al., 2013). The six items are:

- I feel nervous about travelling right now
- Travelling is risky right now
- I would feel very uncomfortable if I was travelling right now
- Travelling now could cause me trouble
- It would be risky for me to travel now
- There is a potential loss for me if I should travel now

To better understand the risk associated with different types of travel, respondents answered these items with respect to domestic travel, international travel, and ocean cruising, with a seven-point Likert-type disagree-agree scale being used in each case. Some background information (e.g., age, gender, and cruising history) was also obtained for classification purposes and open-ended questions were included to provide additional insights into the quantitative data.

Data were collected from 369 cruiser respondents in Australia and the UK in June 2020 at the height of the COVID-19 crisis. The survey was administered by an international consumer panel company and was not intended to be a representative sample of the population of either Australia or the UK, but rather to obtain a mix of respondents who had not cruised and those with cruising experience who were generally representative of the cruising population. Thus, a minimum number of cruisers aged 40 or older was targeted (given the average age of Australian cruisers was 49 and 57 for UK passengers (CLIA, 2019a; CLIA Australasia, 2018). The sample included 283 Australian and 86 UK respondents who had cruised previously, compared to only 6% of Australians (CLIA Australasia, 2018) and 3% of UK residents (CLIA UK & Ireland, 2019) who have cruised when compared to the wider national population. As can be seen in Table 1, the samples were similar in terms of their socio-demographic characteristics.

Table 1: Respondents' background characteristics

Background Variable	TOTAL	Australian	UK
N	369	283	86
Gender	Male 49% Female 51%	Male 48% Female 52%	Male 47% Female 53%
Age (Median)	53 years (54)	55 years (54)	55 years (57)
Household Income	36% Under $52,000 25% $52,000 - 90,999 20% $91,000-155,999 8% Over $156,000	27% Under $52,000 28% $52,000 - 90,999 24% $91,000-155,999 10% Over $156,000	16% Under £24,999 47% £25,000-51,999 16% £52,000-90,999 10% Over £91,000
Education Level (% with University qualification)	45%	46%	44%
Cruise History	32% = 1 cruise 22% = 2 cruises 27% = 3-4 cruises 11% = 5-9 cruises 6% = 10+ cruises	31% = 1 cruise 22% = 2 cruises 29% = 3-4 cruises 11% = 5-9 cruises 7% = 10+ cruises	31% = 1 cruise 22% = 2 cruises 29% = 3-4 cruises 11% = 5-9 cruises 7% = 10+ cruises
Work Status			
% Full-time	31%	30%	36%
% Self-Employed/ Part-time	27%	27%	26%
% Retired	31%	32%	30%
Unemployed/stood down because of COVID-19	10%	11%	8%
Relationship Status			
% with partner (%married)	70% (58%)	72% (59%)	66% (56%)
%no children in house (%childless)	67% (27%)	68% (27%)	64% (26%)

Data Analysis

An initial analysis suggested some of the risk items were very highly correlated across the three contexts, which meant it was not possible to assume discriminant validity between them. Consequently, some items were removed from some of the contexts, which meant four international travel and five cruising items were retained, as can be seen in the Appendix. When this was done, the three contexts had discriminant validity. Further, following Thomas et al.'s (2001) suggestion, it was clear removing these items had not affected the nature of the scales, as the correlations between the original and revised scales were 0.98 for the cruising scale and 0.81 for international travel. The descriptive statistics obtained for the three risk scales after these revisions can be seen in Table 2. As can be seen in the Table, cruising and international travel rated as high risk (5.87 and 5.79 respectively), while domestic travel was

less risky. Interestingly, the scales all had reasonable variability (as can be seen in their standard deviations), suggesting there may be some heterogeneity in responses. The alpha coefficients and construct reliabilities were all high (well above 0.80), suggesting reliabilities were acceptable, while the AVE scores were all well above 0.50, suggesting convergent validity could be assumed (Fornell & Larcker, 1981). Finally, discriminant validity was assessed by examining the AVE scores and their correlations. In this case, all the AVE scores were higher than their relevant squared correlation, suggesting discriminant validity could be assumed (Fornell & Larcker, 1981). Further, HTMT ratios were also computed and there were all less than 0.90, supporting the scales' discriminant validity (Henseler et al., 2015).

Table 2: Risk Scales' Descriptive Statistics

Perceived Risk Construct	Mean	SD	Alpha	Construct Reliability	AVE Score
Domestic Travel	4.12	1.52	0.94	0.94	0.73
International Travel	5.79	1.29	0.88	0.88	0.64
Cruising	5.87	1.30	0.91	0.91	0.67

As it seemed likely there was heterogeneity in the data, a cluster analysis was undertaken to see whether there were different subgroups. Cluster analysis aims to identify homogeneous subgroups, allowing researchers to identify any "natural structure among the observations based on a multivariate profile" (Hair et al., 2014, p. 415). Ward's (1963) hierarchical clustering method was used to do this, as it minimises within-group variation and tends to produce clusters of similar size (Sweeney et al., 2011; Viswanathan et al., 2007). A five-cluster solution emerged as the most appropriate when considering minimum cluster sizes and a maximum and acceptable point biserial correlation coefficient (0.46 in this case) (Milligan & Mahajan, 1980; Soutar & Sweeney, 2003). The multivariate differences between the groups were examined by following Soutar and Sweeney's (2003) suggestion of estimating a discriminant analysis in which the five groups were the dependent variable, and the three risk contexts were the explanatory variables. The analysis suggested the cluster analysis had found five distinct subgroups, as the F-statistics based on the Mahalanobis distances between the groups were all significant well beyond the 0.0001 level. Further, the I-square statistic suggested by Peterson and Mahajan (1976) indicated the discriminant analysis explained 91% of the variation between the groups. Clearly, the groups are distinct and worthy of further attention and their mean scores can be seen in Table 3.

Table 3: Mean Scores (Five Groups)

Group	1	2	3	4	5
Domestic Travel	2.82	3.14	5.82	4.78	2.46
International Travel	4.97	6.59	6.83	5.41	3.15
Cruising	5.00	6.64	6.88	5.56	3.12
Group Size	48	99	88	100	34
Group Name	Moderate risk in cruising	High risk in cruising	High risk all travel	Moderate risk all travel	Low to moderate risk all travel

Quantitative results

As can be seen in Table 3, there were real differences in group members' risk perceptions, which led to the names they were given, which are also shown in the table. There were notable differences between the groups, and this provides insight about cruisers' risk perceptions. There were also some differences in their backgrounds, as can be seen in Table 4 and is discussed in more detail within each group. Groups 3 and 4 perceived the most risk in all travel, compared to groups 1 and 2 which perceived risk in cruising and international travel, but not domestic travel. Groups 1 and 2 also appear to feel risk was manageable, with group 5 perceiving the least risk in any form of travel. Each group is discussed in more detail in the following section.

Group 3 perceived all travel as very risky, including concerns about domestic travel. This group had the highest proportion of females, and more group members were retired. This group had a greater change in their views about cruising, with 85% feeling less positive now than before the pandemic and 85% saying they were much less willing to cruise now. There was also the highest negative response compared to the other groups with 30% responding they would never cruise again. Group 3 are most risk avoidant.

Groups 1 and 2 saw domestic travel as manageable, but international travel and cruise travel as risky. These groups' members were more likely to be in full-time employment. Group 2 had the second highest percentage of responses saying they would never cruise again (24%), with 39% saying they were much less willing to cruise again. Further, 32% of Group 2 respondents said their attitude to cruising had changed and they felt much less positive about cruising,

compared to 4% for group 1. Interestingly, 58% of Group 1 members said they would cruise again when it was safe, even though these respondents were 50% less willing to cruise.

Group 4 members saw all travel as moderately risky, with 45% saying they would cruise again once it was ‘safe’ and 25% reporting no change to how they felt about cruising. However, 54% said they were less positive about cruising because of the pandemic, and 59% were less willing to cruise. This group had the highest proportion of members holding bookings impacted by COVID-19.

Group 5 members had least concerns about travel risk. This group had much higher percentages of males and UK respondents than in the others and was the most experienced group of cruisers, with several respondents having cruised 10 times or more. This group’s members were less likely to have changed how they felt about cruising (47%), with 50% saying the pandemic has not changed their willingness to cruise.

Table 4: Background Differences between the Groups

Characteristic	Group 1	Group 2	Group 3	Group 4	Group 5	TOTAL
Gender	52% M: 46% F	44% M: 56% F	41% M: 59% F	45% M: 55% F	71% M: 29% F	47% M: 53% F
Country	77% AU: 23% UK	88% AU: 12% UK	78% AU: 22% UK	74% AU: 26% UK	47% AU: 53% UK	77% AU: 23% UK
Average Age	54 years	57 years	58 years	52 years	55 years	55 years
Work status	42% Full-time employed. 17% Retired	26% Full-time employed. 40% Retired	17% Full-time employed. 41% Retired	38% Full-time employed. 22% Retired	27% Full-time employed. 29% Retired	31% Full-time employed. 31% Retired
How many previous ocean cruises? (Top 3 responses)	29% x 2 27% x 3-4 25% x 1	33% x 1 28% x 3-4 16% x 2	36% x 1 27% x 2 19% x 3-4	31% x 1 30% x 3-4 24% x 2	32% x 3-4 29% x 1 21% x 10+	32% x 1 22% x 2 27% x 3-4 11% x 5-9 8% x 10+
Were you holding bookings impacted by COVID?	Yes: 29% No: 71%	Yes: 16% No: 84%	Yes: 14% No: 86%	Yes: 21% No: 79%	Yes: 18% No: 82%	Yes: 19% No: 81%
How soon do you expect to cruise again (by % responses	58% When it is safe. 29% Do not know. 6% Never 6% As soon as possible	36% When it is safe. 37% Do not know. 24% Never 2% As soon as possible	36% Do not know. 33% When it is safe. 30% Never 1% As soon as possible	45% When it is safe. 34% Do not know. 13% Never 8% As soon as possible	41% Do not know. 32% When it is safe. 24% As soon as possible 3% Never	41% When it is safe. 36% Do not know. 18% Never 6% As soon as possible
Change in willingness to cruise	50% Less Willing (4.2% Much less willing) 38% no change	62% Less Willing (39% Much less willing) 13% no change	85% Less Willing 60% Much less willing) 13% no change	59% Less Willing (17% Much less willing) 18% no change	18% Less Willing (3% Much less willing) 50% no change	65% Less Willing (30% Much less willing) 26% no change
Change in attitude	56% Less positive (4.2% Much less positive) 35% no change	72% Less positive (32% Much less positive) 26% no change	85% Less positive (56% Much less positive) 13% no change	54% Less positive (15% Much less positive) 25% no change	29% Less positive (3% Much less positive) 47% no change	64% Less positive (27% Much less positive) 26% no change

Qualitative results

Responses to the open-ended question that asked respondents to comment on how they might change the way they cruise in future were analysed using the Leximancer text-analytic software. Leximancer identifies the underlying themes and related concepts within a corpus of text using word occurrence and co-occurrence counts to extract major thematic and conceptual content to generate a concept map, or tables, that indicate key concepts and conceptual relationships (Angus et al., 2013). This software provides a robust, machine-supported way to analyse text-based qualitative data (Biroscak et al., 2017; Lemon & Hayes, 2020). It generates both tabular and visual reports, the latter being concept maps (see Figure 1), which display the concept seeds found in the data, linkages between them, and how they are clustered into themes within the corpus in coloured "bubbles" that are labelled automatically by the software. Themes that contain the highest proportion of responses (hits), are visualised with "hotter" colours (e.g., red).

A total of 352 respondents provided comments and these data were used in the Leximancer analysis. These comments were placed into their risk groups based on the cluster analysis discussed earlier. Figure 1 shows the concept map obtained from this analysis using the same five distinct groups identified in the cluster analysis, while Table 5 identifies the themes obtained from this analysis.

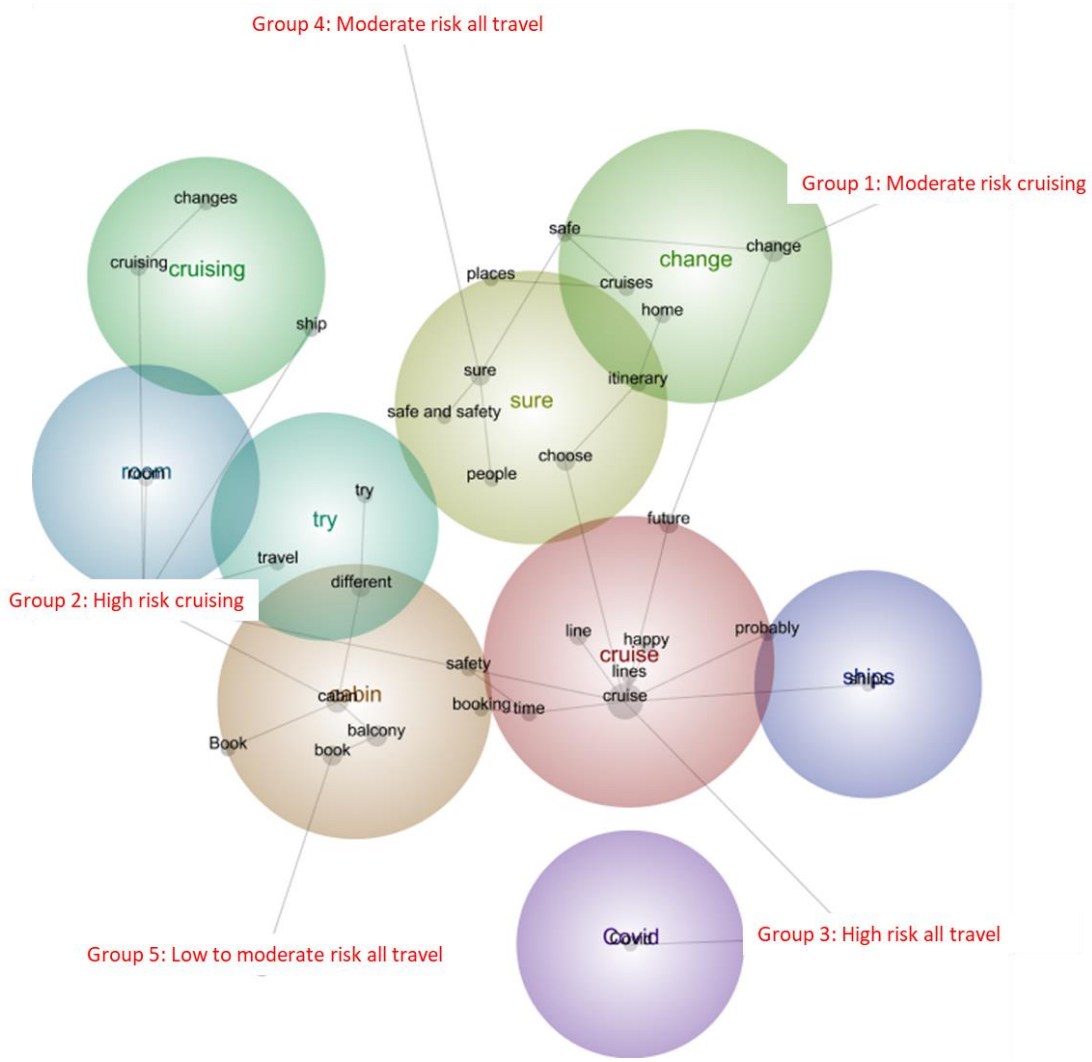

Figure 1: The Leximancer Concept Map

As can be seen in Figure 1, nine major themes emerged from the Leximancer analysis. Of these, the most important was **CRUISE**, which focused on respondents' perceptions of whether they would be happy to cruise again in the future due to the impact of COVID-19. As the indicative text listed in Table 5 suggests, this focused on respondents feeling they would give more attention to selecting cruise companies they feel were more trustworthy and offered safe ships. This extends to selecting itineraries that stopped at safe ports and that were either cruising closer to their home ports, and/or had less crowded ships with the right mix of passengers (e.g., adults rather than families and children). It is worth noting the theme **SHIPS** was connected to the **CRUISE** theme. This theme focused on the desire for ships that were perceived to be clean, with more and better medical staff and facilities. There was also a clear preference for smaller ships that were less likely to pose a health risk.

The **CABIN** theme was the next most important and reflected respondent's desires to secure cabins with a balcony or more space. This appears to be a response to a perceived need to have access to fresh air, not just for the benefits of this for health, but in case they were caught by a COVID outbreak that required them to be quarantined in their cabin.

The next most important theme was **CHANGE**. This reflected respondents' apprehension about whether to cruise, and a desire to ensure any future cruising was safe. However, there were comments, as shown in Table 5, which indicated a desire for a smaller "boutique" cruise experience that might be closer to their home port. This was followed by the theme **SURE**, which was connected to the **CHANGE** theme. The focus of the theme was respondents' perceptions about what actions they might be able to take to make sure they were safe. This included choosing itineraries that were closer to their home port, securing a balcony cabin and cruising on ships that offered more safety from disease.

The fifth most important theme was **CRUISING**, which included respondents wanting shorter cruises, but also comments about their willingness to ocean cruise in future. This theme was closely associated with the theme **ROOM**, which focused on a desire for a balcony cabin, with access to fresh air and sufficient space. The other two themes were **TRY**, which related to respondents' desire to find a safe cruise experience, and **COVID**, which focused on their concerns about the need to find a vaccine or cure for the COVID-19 virus or to travel only to countries considered virus free (e.g., Australia and New Zealand).

Table 5: The Key themes and concepts

THEMES	HITS	CONCEPTS	INDICATIVE TEXT
CRUISE	109	Cruise, future, line	I will only book a cruise in the future with a reputable cruise line that is transparent and trustworthy. I would probably be looking to change my cruise line in the future. I would also like to choose an itinerary close to my home. A better-quality line that doesn't have families. I'm dissatisfied with all cruise line companies as there ruining the oceans and ports. The only cruise I may consider in the future would be a European river cruise.
CABIN	75	Cabin, balcony, book, different	Book different cabin type. Book a different type of cabin. Cabin with a balcony, shorter cruise, different destination. Book a balcony cabin.

THEMES	HITS	CONCEPTS	INDICATIVE TEXT
			Will always book a balcony cabin. Never sail for more than 14 days.
CHANGE	65	Change, cruises, home	If the COVID-19 was resolved (i.e., cure or safe vaccination) I wouldn't change the way I cruise in the future. Unless the situation is resolved I won't be going on any cruises. Would not change anything – Silverseas offers small numbers and staff who provide excellent service and appear happy to work on the ships. Would not do a cruise on the cheap cruises that have thousands. Closer to home. Itinerary closer to home. Closer to home sailing from an English port.
SURE	53	Sure, choose, itinerary	I will choose itinerary closer to home and make sure it's safe. I would choose an itinerary closer to home. Choose itinerary closer to home. I would make sure I booked a balcony cabin, I would research cruise lines for people's reviews, I would find an itinerary closer to home. I would probably be looking to change my cruise line in the future. I would also like to choose an itinerary close to my home.
CRUISING	19	Cruising	Shorter cruising. I won't be cruising until a vaccine is created and available. Not cruising. Doubt if this applies to me, not planning on cruising again. Depends on where I decide to go if cruising.
SHIPS	8	Ships	Clean ships, more health workers. Go on smaller ships. Won't go on large ships. More secure healthy on-board experience, more doctors on ships, better health service. Smaller cruise ships, like the Sea Cloud II.
ROOM	8	Room	Would request a disabled room or balcony. I need fresh air due to my advanced lung disease. Balcony room for fresh air. Carefully choose ports. Wait and ensure I have a balcony room. Would love to have balcony room. I would make sure I have a large room and ensure that all passengers are checked before the cruise.
TRY	7	Try	Will try to book as personalised as it can b. We had a bad experience according to other cruisers – so I MIGHT try again – not sure where. Would only try to go to new places that I have not yet visited.

THEMES	HITS	CONCEPTS	INDICATIVE TEXT
			I think I would try a different cruise line as I thought Carnival was aimed more at young children. I would probably try and book a balcony if I cruised again in case of quarantine.
COVID	6	COVID	Nothing will happen for me until COVID-19 is eradicated. Yes, I think 1st thing is safety, no COVID-19 impact, complete security, clean and completely sanitised. I am afraid now if COVID makes me stuck in cruise itself. Only visit places with good record on COVID e.g., NZ, Australia. Will enjoy more than previous because after long time may take trip for this due to COVID-19.

The Five Subgroups

The Leximancer software enables sub-populations to be separately coded to identify any similarities or differences that exist between them. By coding the sub-populations e.g., moderate risk cruising (Group 1), high risk cruising (Group 2), high risk all travel (Group 3), moderate risk all travel (Group 4), and low risk all travel (Group 5), it was possible to generate their orientation within the concept map as illustrated in Figure 1. As can be seen, there were differences between these groups with each being more closely associated with a different theme or set of concepts found within the corpus of text. These differences are discussed below.

Perhaps the most noticeable relationship was with Group 3, who were closely associated with the theme **COVID**, suggesting their concerns about the risks from COVID-19 had increased their risk perceptions for travel of any kind, not just cruising. Group 2 were closely associated with the **CABIN**, **ROOM**, and **TRY** themes, indicating their desire to mitigate risk by ensuring that they can secure a suitable cabin with a balcony and sufficient space in case they are forced into quarantine while on the ship. By contrast, Group 1 were closely associated with the theme **CHANGE**, which reflects, in many cases, a view that they would not seek to change much, although they might select cruise itineraries that were closer to their home ports or that are run by cruise companies with smaller ships, they consider to be safer. Group 4 was linked to the theme **SURE**, which included concepts relating to the selection of travel arrangements that might serve to mitigate the risk of infection. A further Leximancer analysis of each of the five groups separately highlighted these differences and the results obtained are discussed in subsequent sections.

Group 1: Moderate risk perception for cruising

The most important issue for this group was their ability to secure cruise itineraries they felt were safer (e.g., closer to their home ports and booking a cabin with a balcony). They also preferred smaller ships they perceived would be less likely to spread the COVID-19. Examples of comments from this group were:

- "I would probably be looking to change my cruise line in the future. I would also like to choose an itinerary close to my home."
- "I would possibly choose a balcony cabin and definitely choose a liner that only carries a small number of passengers."

However, it is also worth noting that many within this group expressed a view that they would not change anything, reflecting their moderate level of risk perception.

Group 2: High risk perception for cruising

Many in this group reported they would never go on a cruise ship again. For those that did feel they might try cruising in the future, there was a strong preference for smaller ships with fewer passengers and a desire for cabins that provided access to fresh air through windows or balconies. Despite this, many of this group's members did not see a need for changes to cruising.

- "I won't be cruising again."
- "The only cruise I may consider in the future would be a European river cruise."

Group 3: High risk perception all travel

This group was very negative about any future cruise travel. As with Group 2, members expressed a strong desire for cabins with a balcony. In addition, they indicated a preference for shorter journeys within areas adjacent to their country of origin. There were also calls for ships to be smaller, with safer itineraries, as well as better medical and hygiene services on board. Interestingly this group also highlighted a desire to consider the overall impact of cruise activity:

- "I would ensure that the cruise line has every safety measure in place that they should have, and that they are also addressing environmental impact and taking steps to be greener."
- "Yes, I think, 1st thing is safety, no COVID-19 impact, complete security, clean and completely sanitised."

Group 4: Moderate risk perception all travel

This group focused on a need to secure cabins with balconies or some access to more space and fresh air. The cabin was an important consideration in any future cruise travel intentions. However, this group had many members who did not feel there was a need for change.

- "Balcony room for fresh air."
- "I would make sure I have a large room."

Group 5: Low to moderate risk perception all travel

This group showed a strong interest in securing cabins with balconies and windows with fresh air. They also wanted larger, more comfortable cabins, and had an interest in finding cruise lines with a good track record of maintaining health and hygiene. Their interest in securing larger rooms with access to fresh air seems to be motivated as much by an assumption that this would be a more enjoyable way to spend time if forced into quarantine than would be a smaller room on the inside of the ship. However, some group members did not feel there was a real need to change.

- "I would probably try and book a balcony if I cruised again in case of quarantine."
- "More secure health on-board experience, more doctors on ships, better health service."

Discussion

The cluster and Leximancer data analyses revealed differences in risk perceptions across the cruiser sample and found five distinct groups with different risk perceptions and different risk handling approaches (i.e., risk mitigation, risk avoidance and the use of risk relievers). Interestingly, prior cruise experience did not influence risk perceptions as might have been expected when compared to other research which had suggested prior experience reduced perceived risk (see Fuchs & Reichel, 2011). Risk mitigation was seen in avoiding air travel, booking directly with cruise lines and at the last minute, choosing river cruises as these ships are smaller and buying better travel insurance. Risk avoidance included avoiding all cruise travel, delaying purchase and waiting until there was a vaccine or until travel was deemed 'safe'. This was noted by groups 2 and 3, which had many members indicating they would not cruise again. However, members in group 2 might be willing to cruise again if they felt it was safe, suggesting the importance for cruise lines in promoting a safe experience and the critical role of risk handling.

Risk relievers included choosing larger cabins with a balcony to have access to fresh air. There was a desire to cruise closer to home, as domestic cruising was seen as 'safe'. This relates to how Wolff et al. (2019) suggests risk perceptions are evaluated in comparison to 'home', with home judged as less risky than abroad. Other risk relievers included travelling on smaller ships with less people, which contrasts with the current industry trend to build increasingly larger ships (see Castillo-Manzano & López-Valpuesta, 2018). For example, Dream World Cruises was set to launch a cruise ship (*Global Dream)* in 2021 which would have carried 9000 passengers (Dream Cruise Line, 2019). The results from this study suggest cruise passengers may not be interested in returning to the larger cruise ships. Both Australian and UK respondents expressed a preference for smaller ships, as the large mega-ships were viewed as more dangerous. The respondents from the UK were more likely to engage in risk relievers, whereas the Australians were more likely to suggest they plan to avoid all risk by avoiding cruising at this time.

The findings indicated group 5, which contained more experienced cruisers, were less likely to have experienced change in their willingness to cruise. This contrasts with the other four groups, which suggests more research is needed to better understand the role of prior cruise experience on risk perceptions, but also what impact other factors may have. Group 5 members were more likely to be male and from the UK, suggesting gender or country of residence may also influence risk perceptions. Group 5 also saw all travel as low risk and had done the most number of cruises, some having completed 10 or more. Group 3, which was the least willing to cruise again was more likely to be female and from Australia.

A surprising finding was that respondents said they would research the cruise line more in future to determine health measures and medical facilities onboard. This contrasts with previous studies which found cruise passengers were not concerned about health risk and trusted the cruise lines to take care of them and take appropriate precautions (Holland, 2020). Further, they expected cruise ship companies would maintain higher standards of cleanliness and disease control. Respondents also suggested they would look for changes to ship design to ensure improved ventilation and consider a brand's reputation for handling viruses to select cruise operators and itineraries that were perceived as COVID-safe. Concern was expressed about travelling with fellow passengers, with a distinct preference for those from "safe" countries who were less likely to bring the virus onboard and/or who would behave correctly. These cruisers only wanted to visit port destinations that were perceived as "safe".

Conclusions

The challenges presently facing the global tourism industry and the cruise sector are unprecedented and both will need to address tourists' fears and anxieties about travel. This study contributed to this discussion by providing insights into how cruise tourists are likely to manage risk and the impact COVID-19 has had on risk perceptions. The study addressed some identified research gaps by exploring how Australian and UK cruisers' perceptions of the risk of cruising have changed because of COVID-19. It considered differences between the two regions in addition to differences between the five identified subgroups' perceived risk of domestic, international and cruise travel. It seems people's willingness to cruise and attitudes toward cruising are more negative because of the pandemic, although this is not uniform, as some subgroups were more impacted than others. For the cruise industry to rebound after the pandemic, the sector will need to consider how cruise passengers will manage risks in response to COVID-19.

The results indicate cruise lines can develop different strategies in relation to how different groups seek to manage risk and whether they perceive domestic or international travel as risky. This study provides a contribution by revealing that cruise experience did not uniformly influence risk perceptions, as all respondents were cruisers but reacted differently, some reporting they were much more negative about cruising and much less willing to cruise again, while others indicated no change in the perceived risk of cruising. As cruise experience may play a role in reducing risk perceptions, more research is needed to better understand the differences between groups and how other factors such as gender and country of residence may potentially influence perceived risk.

This study presents specific risk reduction methods and strategies that cruisers have identified they plan to employ in the future, and as such adds to the literature on risk handling for cruise passengers. This study builds on the emerging literature on tourists' perceptions of risk of ocean cruising, adding to the empirical work of Holland (2020), Le and Arcodia (2018) and Liu-Lastres et al. (2019). This study also contributes to the developing literature exploring cruise tourism specifically in relation to Australia and the United Kingdom, two important passenger source markets that have been overlooked and underdeveloped in comparison to studies exploring cruisers from other regions. To restore and strengthen consumer confidence, the cruise industry should promote the use of risk relievers in marketing (see also Hasan et al., 2017) and frame communication to address consumer anxieties (Chua et al., 2021; Quintal et al., 2021). Marketing should focus on smaller ships, balcony cabins, domestic cruising where

no flying is needed, and offering shorter itineraries. They may also focus on flexible change and refund policies to decrease concerns about potential financial loss (see also Chua, 2020). The industry and cruise lines are encouraged to develop more transparent and detailed communication to demonstrate how they are addressing anxieties about cruise travel and minimising risk, to further increase consumer confidence. This accords with Quintal et al.'s (2021) observations about the importance of promoting health protocols pre, during and post-cruise. Above all, this study demonstrates the cruise industry needs to take care to not assume cruisers will automatically return, and to develop risk reduction strategies that will assist in a rebuilding the sector.

Declaration of interest

No potential conflict of interest was reported by the authors.

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