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The impact of cruise ship dinescape on travellers' behaviour

Peter Björk, Hannele Kauppinen-Räisänen and Erose Sthapit

Abstract

Purpose – *This study aims to examine how cruise ship dinescapes, as a specific type of organized and staged service environment, influence customers' attitudes, on-board behaviour, satisfaction and behavioural intentions.*

Design/methodology/approach – *Data was collected using a cross-sectional survey from 552 passengers on-board one of the big cruise ships with a Caribbean itinerary.*

Findings – *Cruise ship dinescape, as an on-board food experience platform, is built on three dimensions: restaurant atmospherics, interactions with other guests and restaurant staff. The findings show how these dimensions influence passengers' emotional experiences and quality perceptions. The results also show how travellers' cruise ship dinescape satisfaction affect their overall vacation satisfaction and future travel behaviour.*

Practical implications – *The findings imply that cruise companies should pay extra attention to organised food service environments like dinescapes staged for passengers. Through these scapes cruise companies may provide favourable platforms enabling dining satisfaction, but also social interaction and co-creation of memorable experiences.*

Originality/value – *This study builds a comprehensive model in cruise ship context, which links dinescape experiences to overall cruise ship dining experiences and dining behaviour mediated by emotional and perceived quality outcomes with further consequences.*

Keywords *Atmospherics, Cruise ship, Customer satisfaction, Dinescape, Foodscape*

Paper type *Research paper*

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Introduction

In 2020, due to COVID-19 the cruise industry faced heavy declines (even more than 50%) in the number of passengers and revenue compared to 2019 (Cruise Market Watch, 2021). In 2021, the industry hosted almost 14 million passengers with a total of $23.8bn in revenues being 81.8% of the revenues in 2020. The industry is resilient and is coming back to life, and the industry is expected to continue growing in the post-pandemic era (Yeginsu and Chokshi, 2021).

Travellers are drawn to the unique hybrid service environment, which is simultaneously accommodation and transportation (Weaver, 2005). Cruise ship is to Kwortnik (2008, p. 293) a "context-specific type of servicescape that includes both the man-made physical and social environment in which the cruise service is delivered". Organized and staged for cruise travellers, this environment provides continuous service that contributes to a variety of experiences and is replete with travellers' interactions with the environment and it's tangible and intangible features, other guests and staff (Björk and Kauppinen-Räisänen, 2019). Adding to its uniqueness, a cruise ship is also a closed service environment, a place in which travellers experience services, like those related to food, several times a day for multiple days, even weeks. Throughout the entire voyage, travellers are active actors and integrated and immersed into the servicescape (Lallani, 2017).

The provision of food plays an integral part of cruise services and passengers' travel experiences (Gibson and Parkman, 2018). This study focuses on food experiences lived in the main dining environment also referred to as dinescape (Ryu and Jang, 2008). Dinescape is one of cruise ship foodscape's service environments. The main dining room serves as the default dining venue for most passengers and embodies the ship's experiential foodscape. This venue has a more formal dress code. Also, table sharing is a part of the social activities on board. There are numerous additional food service environments accessible as well, including buffet restaurants, steakhouses and restaurants with ethnic themes – all in which food is served, consumed and experienced (Lallani, 2017).

The focus on cruise ship dinescape is based on three research gaps. First, numerous studies have investigated the relationship between servicescape, customers' quality perceptions, satisfaction and behavioural intentions in contexts such as hotels and land restaurants (Lee and Chuang, 2022). Yet, servicescape, foodscape and dinescape have yet not been fully explored in a cruise ship context (Calza *et al.*, 2020; Lyu *et al.*, 2017).

Second, most restaurant servicescape studies focus on land restaurants. As servicescape is a context-dependent construct (Lyu *et al.*, 2017), it is unknown whether the same set of antecedents, consequences and outcomes of land restaurant experiences are valid in the unique cruise ship restaurant context.

Third, research stresses that physical and social features characterize service environments (Line and Hanks, 2020). To Radic (2018) the cruise ship service environment is a "service theatre" collaborated by the service setting, employees and guests. Still, most restaurant servicescape research focuses on physical or social features; few have taken an expanded approach on the servicescape and studied both (Lee and Chuang, 2022; Line and Hanks, 2020).

Against the previous background, this study investigates how the cruise ship dinescape – with its physical and social features – as a specific type of food service environment, influences passengers' attitudes, on-board behaviour, satisfaction and behavioural intentions. In doing so, the study answers calls for further research on servicescape beyond hotels and land restaurants (Calza *et al.*, 2020; Line and Hanks, 2020) and contributes with a comprehensive cruise ship dinescape model including an on-board dining behavioural dimension.

Conceptual background and hypotheses development

Context-dependent construct of scape

Kotler (1973) stressed the physical retail environment and its ability to evoke emotions, affect cognitive processes and enhance consumer behaviour through sight, sound, smell and touch. Kotler's (1973) idea of atmospherics or "quality of the surrounding space" (p. 50) was advanced by Booms and Bitner (1982), who described the physical retail environment as" the environment in which the service is assembled and in which seller and customer interact, combined with tangible commodities that facilitate performance or communication of the service" (p. 36). Bitner (1992) introduced the servicescape framework, which explains the antecedents to and consequences of the service encounters' physical surroundings on customer responses. Inspired by the experience era (Pine and Gilmore, 1998), Mossberg (2007) defined these organized environments as experiencescapes.

Rosenbaum and Massiah (2011) presented the expanded servicescape framework comprising physical, social, social-symbolic and natural dimensions. The physical dimension refers to features in the exterior and interior including lightning and sound (Line and Hanks, 2020). The social dimension includes other customers, employees and aspects of social density, like crowding (Hanks and Line, 2018), while the social-symbolic dimension encompasses symbols and artefacts reflecting a specific culture (Bitner, 1992). The natural

dimension comprises spatial aspects like clean air, which influences customers' state of mind and relaxation (Lyu *et al.*, 2017).

The servicescape construct has proved useful in various settings, including land dinescape (Ryu and Jang, 2008) and shipscape (Kwortnik, 2008). These studies evidence the idea that scapes are context-specific, whereby findings from one servicescape cannot simply be transferred to another (Lyu *et al.*, 2017).

Drawing on past research, this study develops a conceptual framework. Figure 1 summarises the hypotheses and the effects of dinescape variables (e.g. atmospherics, other guests and staff) on travellers' affective and cognitive evaluations (e.g. emotional responses and perceived quality). It also shows the dependent variables (on-board loyalty/variety seeking dining behaviour, dinescape satisfaction, cruise vacation satisfaction and future behavioural intentions).

Effect of cruise ship dinescape on affective evaluation

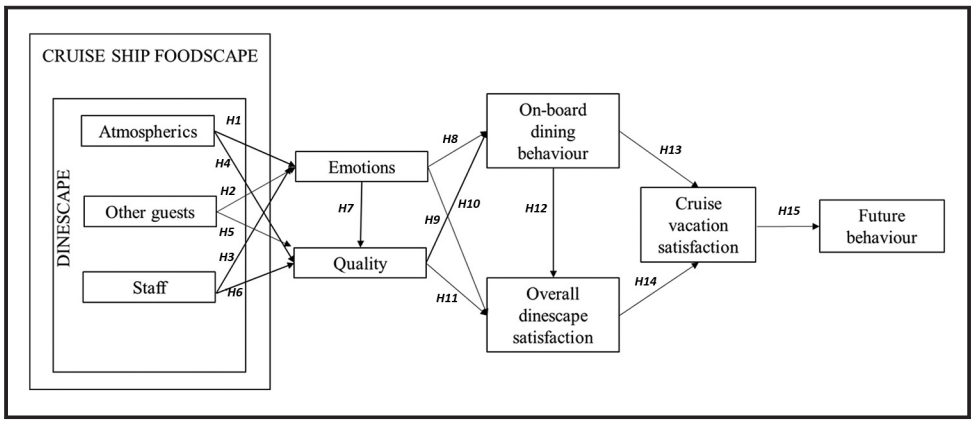
Research acknowledges how the service environment and its physical, social and social-symbolic dimensions evoke emotions in customers (Mehrabian and Russell, 1974; Wu and Gao, 2019). Emotions are evoked by atmospherics triggered by interior design and décor, ambience and spatial layout (Nyamekye *et al.*, 2021). Research further stresses how social interaction – with other customers and staff – may evoke emotions (Manthiou *et al.*, 2020). For example, staff member's friendliness and helpfulness can increase customers' pleasure and/or arousal (Brownell, 2014; Hanks and Line, 2018). Interestingly, recent research stresses how atmospherics and the human aspects are collectively created and experienced (Steadman *et al.*, 2021).

Gourmet restaurants, food courts and culinary service are vital aspects of a cruise ship, and they may even influence the vessel choice (Lallani, 2017; Lyu *et al.*, 2017). The main dining venue's luxurious and decorative appearance may make it a key draw creating an atmosphere influencing passenger on-board emotions (Scherer, 2005). According to research, taking a cruise is a highly emotional experience created partly by social interaction with other passengers and the crew (Calza *et al.*, 2020). In a cruise ship dinescape context, we propose the following:

H1. There is a positive relationship between perceived atmospherics and experienced emotions.

H2. There is a positive relationship between other guests and experienced emotions.

Figure 1 The study's theoretical framework



H3. There is a positive relationship between experiences with restaurant staff and experienced emotions.

Effect of cruise ship dinescape on cognitive evaluation

Studies report that the role of service environment's physical features increase with service's intangibility (Aubert-Gamet and Cova, 1999) and that the environment's role is more important for hedonic than for utilitarian services (Reimer and Kuehn, 2005). The elements comprising the environment's atmosphere are sensed (Ha and Jang, 2013) and used to assess the service quality (Shostack, 1977) or as cues for "cognitive evaluation of the performance of a service or a service provider" (Edvardsson, 2005, p. 128).

Research details how elements of dinescape atmospherics like table coverings, cleanliness and napkin type and texture influence restaurant guests' assessment of service quality (Wall and Berry, 2007). Upscale land restaurants' quality is determined by food, physical environment and service quality (Ryu and Jang, 2007), while fine dining guests appreciate more social interaction than casual dining guests (DiPietro and Partlow, 2014; Rye *et al.*, 2008). Fast food restaurant quality is determined by food quality and physical environment rather than by the customer-staff interaction (Slack *et al.*, 2021). In cruise ships, other guests and staff (Hanks and Line, 2018) and staff's responsiveness and trustworthiness impact perceived quality (Chua *et al.*, 2017). In a cruise ship dinescape-context, we propose the following:

H4. There is a positive relationship between perceived atmospherics and quality perceptions.

H5. There is a positive relationship between other guests and quality perceptions.

H6. There is a positive relationship between experiences with restaurant staff and quality perceptions.

Effect of affective evaluation on dining behaviour and overall dinescape satisfaction

Research shows a link between emotional and cognitive evaluations, such that an emotional response may trigger a cognitive evaluation and vice versa (Jani and Han, 2011). Specifically, emotions influence how people process and evaluate information (service quality), implying that positive emotions generally lead to positive evaluations and negative emotions to negative evaluations (Al-Msallam, 2020).

Positive emotions effect behaviour and satisfaction (Ribeiro and Prayag, 2018). Research shows how food quality in tandem with emotions effect restaurant diners' loyalty behaviour (Peng *et al.*, 2017). Studies evidence how restaurant atmospherics can trigger emotions, which in turn can lead to satisfaction (Mattila and Gao, 2017).

Cruise ship foodscape is a specific type of service environment providing a variety of experiences in a wide range of restaurants, large in both number and variety; dinescape is one of them. Following the idea by Volo (2017), a range of emotions are evoked in travellers' spaces such as the on-board dinescape. These emotions can then shape passengers' quality evaluations, effect revisit behaviour and the overall satisfaction. In a cruise ship dinescape context, we propose the following:

H7. There is a positive relationship between experienced emotions and perceptions of dinescape quality.

H8. There is a positive relationship between experienced emotions and cruise ship dining behaviour.

H9. There is a positive relationship between experienced emotions and overall dinescape satisfaction.

Effect of cognitive evaluation on dining behaviour and overall dinescape satisfaction

Research on land restaurants shows a relationship between perceived quality and behaviour (like loyalty behaviour) (Namkung and Jang, 2007) and perceived quality and satisfaction (Lin and Mattila, 2010). Service literature stresses that satisfaction occurs when perceived quality equals or exceeds the expected quality (Parasuraman *et al.*, 1988).

The perceived quality of a cruise ship dinescape may stem from the service environment like the provided service and travellers' social interactions around the dinner table. These may all contribute to passengers' dining behaviour (revisit behaviour) and overall satisfaction (Hanks and Line, 2018; Lyu *et al.*, 2017). We propose the following:

H10. There is a positive relationship between perceived dinescape quality and cruise ship dining behaviour.

H11. There is a positive relationship between perceived dinescape quality and overall cruise ship dinescape satisfaction.

Effect of dining behaviour on overall dinescape and cruise vacation satisfaction

Tourism industry aims to provide positive and memorable travel experiences (Ritchie *et al.*, 2011) and food is a key source of such experiences (Björk and Kauppinen-Räisänen, 2016). Research on land restaurants show how food and dining experiences affect travellers' behaviour, like their revisit behaviour (Björk and Kauppinen-Räisänen, 2016), overall satisfaction and even travel satisfaction (Chang *et al.*, 2021). Specifically, travellers' revisit intentions relate to restaurant satisfaction for both fast food and full-service land restaurants (Slack *et al.*, 2021).

Research assessing food in a cruise ship context shows that the physical environment and its décor, on-board entertainment and social interaction contribute to cruise experiences, and that food and eating experiences influence the overall satisfaction with the food service environment (Lyu *et al.*, 2017). Building on the literature and empirical findings, we propose the following:

H12. There is a positive relationship between cruise ship dining behaviour and overall dinescape satisfaction.

H13. There is a positive relationship between cruise ship dining behaviour and cruise vacation satisfaction.

H14. There is a positive relationship between overall dinescape satisfaction and cruise vacation satisfaction.

Effect of cruise vacation satisfaction and future behaviour

Customer satisfaction impacts a wide range of customer responses like trust, word of mouth (WOM), recommendations, commitment and behavioural intentions. This is confirmed for travellers as positive experiences (like with food), while quality perceptions are found to contribute to travel satisfaction, overall holiday satisfaction and future travel and destination revisit intentions (Björk and Kauppinen-Räisänen, 2016).

Within a cruise ship context, previous studies indicate that overall cruise vacation satisfaction is an antecedent of future travel behavioural intentions (Forgas-Coll *et al.*, 2014), represented by re-cruising behaviour, loyalty and WOM recommendations. Building on the literature and empirical findings, we propose the following:

H15. There is a positive relationship between cruise vacation satisfaction and future travel behavioural intentions.

Method

Data collection

The survey comprises a self-administered questionnaire and non-probability convenient sampling targeted at cruise ship passengers. The passengers were approached in the cruise ship's public areas. The questionnaire was delivered on the last day of the cruise in person by a researcher on-board. This approach was agreed with the cruise-ship company to be the most suitable way to collect data.

To verify the clarity of the statements and check the reliability of the measurement items, an initial pilot survey was conducted among passengers (N = 20) on a large cruise ship. Cronbach's alpha served to verify the reliability of the measurement items and the Cronbach's alpha values for all the building blocks were above the lower limit of 0.6, as recommended by Hair *et al.* (1998). The main survey was conducted on a cruise ship carrying almost 5.000 passengers with a Caribbean itinerary between November 2018 and January 2019. Data was collected during several one- and two-week cruises over a three-month period. The itinerary was selected because in terms of passenger volume, such cruises comprise most of the cruise market (Cruise Lines International Association, 2018).

This *in situ* survey generated 552 responses in total. The respondents were fairly normally distributed in age, from 20 to 60+ years. 75.7% of the respondents were female. 68.1% came from North America. Finally, 39.3% were traveling with children and 84.2% had taken a cruise at least four times before (Table 1). The sample is deemed representative for the Caribbean cruise ship travellers, as the sample statistics align with the statistics presented by Cruise Market Watch (Cruise Market Watch, 2021).

Table 1 Respondent profiles (N = 522)

Sample statistics	*No.*	*%*
Gender		
Male	134	24.3
Female	418	75.7
Age		
20–29	11	2.0
30–40	88	15.9
41–50	118	21.4
51–60	158	28.6
60+	177	32.1
Highest education		
High school	119	21.6
Associate degree	94	17.0
Bachelor's degree	203	36.8
Master's/Doctoral degree	136	24.6
Place of residence		
North America	376	68.1
Europe	151	27.4
Asia	25	4.5
Cruised before		
1	22	4.0
2–3	65	11.8
=>4	465	84.2
Travelling with children		
Yes	217	39.3
No	335	60.7

Data measures

The questionnaire contained six blocks. Block 1 comprises questions measuring restaurant experience in terms of perceived dinescape. It is based on instruments used to measure restaurant servicescape (Bitner, 1992), including atmospherics (12 items; Lin and Mattila, 2010), employees (two items; Ryu *et al.*, 2012) and other guests (three items; Hanks and Line, 2018). The survey's scale items have been tested and proved useful by other researchers in corresponding studies. Block 2 measures emotional and cognitive evaluations of the dinescape. Three items measure emotions [pleasure–arousal scale by Mehrabian and Russell (1974)] and three items measure cognitive evaluations of service quality. Items in block 3 relate to "on-board dining behaviour" and "overall dinescape satisfaction" measuring passengers' dining behaviour in terms of variety seeking and loyalty and overall cruise ship dinescape satisfaction [seven scale items by Jung and Yoon (2012) and Ha and Jang (2013)]. Passengers can choose between a wide range of restaurants being an indication of variety seeking behaviour. Also, they all provide food and eating experiences, which are recognized as a central quality dimension in cruise tourism (Lallani, 2017), accompanied by entertainment and lodging, for example (Testa and Sullivan, 2002). Block 4 measures the overall cruise vacation satisfaction. Respondents were asked how satisfied/unsatisfied, pleased/displeased and favourable/unfavourable they felt with their vacation. Five items in block 5 measure behavioural intentions in line with previous studies (Lobo, 2008). Block 6 collected information about the respondents' demographics and travel behaviour.

Items in blocks 1, 3 and 5 were measured with a five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree"). Items in blocks 2 and 4 were measured with a semantic differential scale.

Data analysis

This study used SPSS version 25.0 for demographic and descriptive analyses and exploratory factor analysis to identify dimensions of the atmospheric construct. Partial least squares structural equation modelling (PLS-SEM) served to test the hypotheses because of its statistical power for small samples (Hair, *et al.*, 2011), non-normally distributed data (Chin, 1998) and the presence of categorical ordinal variables. This method is also suitable for exploratory research that extends an existing theory, enables the use of both formative and reflective constructs in one model if needed and allows for complexity in models with different types of variables to explain the constructs and their relationships established in hypotheses (Hair *et al.*, 2017).

Results

Sample characteristics and perception of service quality, satisfaction and behaviour

The study's 552 cruise passengers (Table 1) were quite satisfied with their cruise vacation (Σmean = 4.48). They intended to take cruises once more soon (Σmean = 4.0) and share (WOM) their positive experiences (Σmean = 4.48).

The findings support previous studies on the importance of dinescape and dining experiences (Testa and Sullivan, 2002) and restaurant quality's impact on the overall cruise vacation satisfaction (Chua *et al.*, 2016). The exploratory factor analysis applied to identify latent constructs for further tests (Watkins, 2018) shows that dinescape quality is determined by interior design in terms of lighting, seating arrangements, table setting, background music (Σmean = 3.61), the behaviour of other guests (Σmean = 3.59) and the restaurant staff (Σmean = 4.21) (Table 2).

With these high scores, the overall on-board dining experience is positive. The respondents felt excited (Σmean = 3.06), pleased (mean = 4.05) and happy (Σmean = 4.22) and

Table 2 Dinescape quality dimensions/atmospherics

Factors	*Variables*	*Mean*	*Loadings*	*Eigenvalue*	*Cronbach's α*
Seating arrangements	Seating arrangements gives me enough space	3.49	0.862	2.230	0.826
	Layout makes it easy for me to move around	3.34	0.770		
	Seating arrangements makes me feel crowded	3.07	0.856		
Background music	Background music relaxes me	3.49	0.898	1.830	0.895
	Background music is pleasing	3.57	0.914		
Lighting	Lighting creates a warm atmosphere	4.01	0.874	1.743	0.837
	Lighting makes me feel welcome	3.92	0,888		
Table setting	Tableware is of high quality	3.78	0.887	1.665	0.797
	The linens (Table cloths) are attractive	3.81	0.849		

perceived the dining (Σmean = 3.98) and social environment (Σmean = 3.93) as well as the food service (Σmean = 3.86) to be of high quality. They were also satisfied with the number of restaurants (Σmean = 3.96) and cuisines offered (Σmean = 3.9) contributing to an overall positive restaurant experience (Σmean = 4.17).

Analysis of on-board restaurant behaviour identified two main categories of passengers: variety seekers and regular diners. 61% agreed or totally agreed with the statement "When it comes to choosing a restaurant, I am (we are) a variety seeker." Moreover, "even if I am (we are) completely satisfied with a restaurant," 58% claimed that they would choose another restaurant, which implies that the drive to hunt for new or different dining experiences is stronger for some passengers than perceived restaurant satisfaction. Still, some passengers (34.1%) claimed that they "always use the same restaurant" for dining on board.

Measurement model

The fit of the measurement model to the data was appropriate for use in additional analyses when three scale items from survey were omitted, two measured "Atmospherics" and one "Emotions" (Tables 3 and 4). Item loadings, average variances extracted (AVEs) and composite reliabilities (CRs) were assessed for convergent and discriminant validity and reliability (Fornell and Larcker, 1981; Hair *et al.*, 2017). All loadings exceeded the recommended level of 0.7 (Hair *et al.*, 2017), with a few exceptions. Despite this, these items were kept because of the valid values for CR and AVE (Ali, 2016). All CR values exceeded the recommended value of 0.7, indicating constructs' consistency reliability (Nunnally, 1978). Research recommends that AVE scores exceed 0.50 (Chin, 1998), which is true for all first-order constructs. The second-order construct, atmospherics (AVE score 0.398), was kept in the model because of its high loading, *t*-value, CR value and acceptance of the Fornell–Larcker criterion, which states that "a factor's AVE should be

Table 3 Measurement model for the second-order endogenous construct atmospherics

Constructs	*Items*	*Loadings*	t-*value**	*CR*	*AVE*
Lighting	Lighting creates a warm atmosphere	0.930	122.175***	0.925	0,861
	Lighting makes me feel welcome	0.926	106.487***		
Seating arrangements	Seating arrangements gives me enough space	0.918	129.873***	0.896	0.742
	Layout makes it easy for me to move around	0.841	52.442***		
	Seating arrangements makes me feel crowded	0.822	31.809***		
Table setting	Tableware is of high quality	0.909	94.723***	0.908	0.831
	The linens (table cloths) are attractive	0.914	88.477***		
Background music	Background music relaxes me	0.953	198.312***	0.951	0.906
	Background music is pleasing	0.950	170.317***		

Notes: *Critical *t*-values. 1.96** ($P < 0.05$), 2.58*** ($P < 0.01$)

Table 4 Measurement model for the endogenous constructs

Constructs	*Items*	*Loadings*	t-*value**	*CR*	*AVE*
Atmospherics	Lighting	0.728	29.174***	0.887	0.398
	Seating arrangements	0.722	28.786***		
	Table setting	0.728	32.014***		
	Background music	0.663	21.842***		
Other guests	The number of guests in restaurants are always on an acceptable level	0.729	19.073***	0.784	0.548
	There are often guests in the restaurants that do not know how to behave	0.685	13.666***		
	Other tourists spoilt my restaurant experience	0.803	27.364***		
Staff	An adequate number of employees makes me feel cared for	0.855	22.923***	0.739	0.590
	Employees are neat and well dressed	0.670	8.733***		
Emotions	During my restaurant visit I felt pleased	0.923	77.953***	0,921	0.853
	During my restaurant visit I felt happy	0.925	72.414***		
Quality	Excellent dining environment	0.857	62.558***	0.879	0.707
	Excellent quality of food service	0.850	58.093***		
	Excellent social environment	0.815	49.100***		
On-board dining behaviour	For dining on-board, I(we) always used the same restaurant	0.940	8.880***	0.825	0.617
	Even if I(we) are completely satisfied with a dining restaurant, I(we) choose other restaurants	0.674	4.409***		
	When it comes to choice of restaurants, I(we) are variety seekers	0.715	4.964***		
Overall dinescape satisfaction	As a whole, I really enjoyed myself at the dining restaurants	0.881	58.462***	0.900	0.693
	Overall, I am satisfied with my experience at the dining restaurants	0.896	95.440***		
	I am completely satisfied with the number of dining restaurants on-board	0.737	23.463***		
	I am completely satisfied with the number of dining restaurants on-board	0.803	37.652***		
Cruise vacation satisfaction	Overall I am very satisfied with my cruise vacation	0.873	31.298***	0.926	0.806
	Overall I am very pleased with my cruise vacation	0.921	62.295***		
	Overall I am very favourable of my cruise vacation	0.900	35.009***		
Future behaviour	When other people ask you about your experience on-board cruise ship	0.817	31.691***	0.900	0.647
	If somebody asks your advice about cruise ship you will recommend them	0.865	51.722***		
	You will encourage your friends and family to take a vacation on cruise ship	0.879	48.226***		
	It pays off to spend time and money on cruise vacation	0.863	46.894***		
	I will continue to visit cruise ships in near future even if prices increase somewhat	0.552	13.880***		

Notes: *Critical *t*-values. 1.96** ($P < 0.05$), 2.58*** ($P < 0.01$)

higher than its squared correlations with all other factors in the model" (Henseler *et al.*, 2016, p. 11). These findings evidence convergent validity of the constructs. The heterotrait-monotrait estimates for the endogenous factors are lower or close to 0.85, indicating discriminant validity (Appendix) (Henseler *et al.*, 2016). The presence of endogeneity in PLS-SEM can be tested by including control variables in the models or applying the Gaussian copula approach (Hult *et al.*, 2018). The latter is critical in cases of exploratory modelling aims. As we aimed at theory development prediction, it was not necessary (Hair *et al.*, 2011).

On-board dining behaviour, as a mediator affected by cognitive and affective dimensions, influenced overall dinescape satisfaction in tandem with emotional and quality evaluations.

Structural model

Specified hypotheses were tested on the basis of the proposed model using SmartPLS version 3.0. To test the significance of the path coefficients, a bootstrapping procedure with 5.000 iterations was performed. The model does not have a perfect fit, but acceptable, as the SRMR value of 0.10 is somewhat higher than the recommended threshold of 0.08 (Henseler *et al.*, 2016). Of 15 tested hypotheses 11 were fully accepted and four were rejected (Table 5).

Figure 1 shows that atmospherics and other guests' behaviour impact passengers' emotions (*H1* and *H2*), while atmospherics, other guests' and staff's behaviour (*H4–H6*) determine service quality. The results indicate that emotions interact with perceived restaurant quality (*H7*) and influence on-board dining behaviour (*H8*) and overall dinescape satisfaction (*H10*). Perceived quality influences the overall dinescape satisfaction on board (*H10*), which is significantly related to cruise ship dinescape satisfaction (*H14*). Finally, cruise ship vacation satisfaction influences future travel behavioural intentions (H15) (Figure 2).

Hypotheses predicted to explain dinescape behaviour and its effects on cruise vacation satisfaction where rejected (*H3, H10* and *H13*). This may be explained by the fact that passengers are variety-seekers, although being satisfied with all of the restaurants (*H12*). Passengers frequently used the same restaurant throughout their voyage (*H8*) implying how emotions significantly effect dinescape loyalty. Yet, this link appeared not between perceived dinescape quality and cruise ship dining behaviour (*H10*). Also, the results indicate that neat, well-dressed restaurant staff may influence the perceived quality of a restaurant, but not cruise travellers' experienced emotions directly (*H3*).

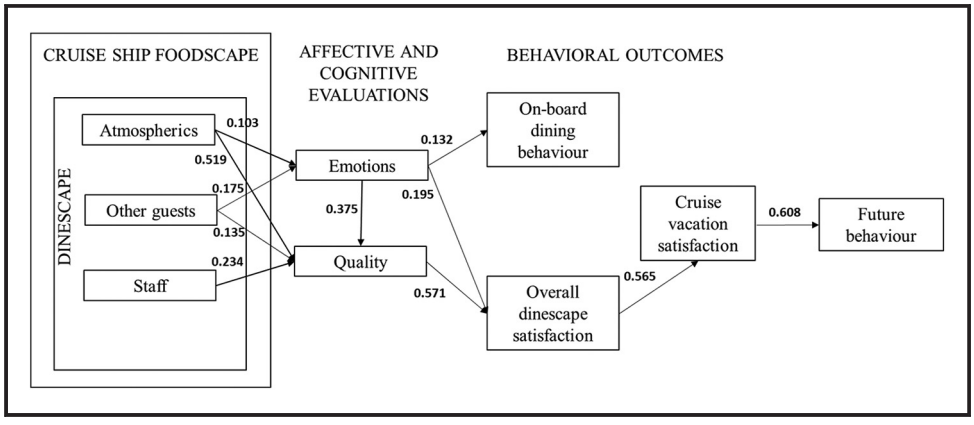
The explanatory power of the predictor variables in terms of R-square for the endogenous latent constructs is moderate and weak according to Chin *et al.* (2008) substantial (0.67), moderate (0.33) and weak (0.19) classifications (restaurant quality = 0.504, dining satisfaction = 0.481, outcome (travel) behaviour = 0.370, cruise satisfaction = 0.315, emotions = 0.313, restaurant behaviour = 0.057). Regarding the magnitude of the effects in the structural model (Cohen, 1988), perceived restaurant quality and emotions mediate the effects of dinescapes on overall cruise ship dinescape satisfaction, cruise vacation satisfaction and future travel behavioural intentions.

Table 5 Structural estimates, hypotheses tests

Path		*Path coefficients*	t-*value**	*Results*
H1	Atmospherics – Emotions	0.103	2.013**	Supported
H2	Other guests – Emotions	0.175	3.424***	Supported
H3	Staff – Emotions	0.020	0.465	*Rejected*
H4	Atmospherics – Quality	0.519	15.242***	Supported
H5	Other guests – Quality	0.135	3.441***	Supported
H6	Staff – Quality	0.234	6.263***	Supported
H7	Emotions – Quality	0.375	6.589***	Supported
H8	Emotions – On-board dining behaviour	0.132	2.348**	Supported
H9	Emotions – Overall dinescape satisfaction	0.195	4.368***	Supported
H10	Quality – On-board dining behaviour	0.144	1.347	*Rejected*
H11	Quality – Overall dinescape satisfaction	0.571	14.687***	Supported
H12	On-board dining behaviour – Overall dinescape satisfaction	−0.003	0.044	*Rejected*
H13	On-board dining behaviour – Cruise vacation satisfaction	−0.028	0.767	*Rejected*
H14	Overall dinescape satisfaction – Cruise vacation satisfaction	0.565	15.605***	Supported
H15	Cruise satisfaction – Behaviour and recommendations	0.608	16.955***	Supported

Note: *Critical *t*-values. 1.96** ($P < 0.05$), 2.58*** ($P < 0.01$)

Figure 2 Structural model and hypotheses test results



Conclusion and discussion

The study makes three *contributions* to the cruise ship foodscape literature. First, by exploring the dinescape concept, the study introduces the construct of cruise ship dinescape, which is defined as *an organized food service environment staged for cruise travellers' dining experiences*. Dinescape is a dynamic food service environment co-created and reconstructed in every single experiential occurrence by the atmosphere, visiting guests and serving staff. This unique experiential service environment rests on tangible and intangible features (Booms and Bitner, 1982) and social interaction (Kim *et al.*, 2010).

Second, by exploring the dinescape concept from a servicescape approach, the study provides a comprehensive cruise ship dinescape model developed and tested with a predictive purpose by the means of PLS-SEM approach. The model portrays linkages between three identified dinescape dimensions and four outcome variables mediated by perceived quality and experienced emotions. The model confirms the essence of the cruise ship dinescape for dining experiences and the overall cruise experience. Specifically, it shows that in cruise ship dinescape context (1) restaurant atmospherics has a positive effect on passengers' emotions and perceived service quality (Nyamekye *et al.*, 2021). Also (2) other guests have a positive influence on experienced emotions and perceptions of service quality (Calza *et al.*, 2020). The model also identifies (3) a strong positive link between restaurant staff appearance and behaviour and perceived service quality (Chua *et al.*, 2017), yet staff does not impact passengers' emotional experiences, though this effect was anticipated from previous research (Liu and Jang, 2009). What's more, the model pinpoint that (4) experienced emotions have a positive impact on perceived quality, behaviour and overall dinescape satisfaction (Mattila and Gao, 2017). The emotional evaluations were particularly found to influence restaurant revisit behaviour. In addition, the study found that (5) perceived dinescape quality effects the overall dinescape satisfaction on board (Hanks and Line, 2018), yet dining behaviour does not add to perceived overall dinescape satisfaction, though this was predicted in the model (Namkung and Jang, 2007). Finally, the model demonstrates that (6) dinescape satisfaction impacts cruise vacation satisfaction, which in turn influences future travel behavioural intentions (Hung, 2018). The relationship between dinescape satisfaction, overall vacation satisfaction, and travel-related behaviour were positive and significant. All in all, the study confirms the utility of previously presented restaurant experience models (Ryu and Jang, 2008) in cruise ship dining restaurant contexts.

Third, a more detailed analysis contributes to the cruise ship foodscape literature by showing which factors make up dinescape experiences. When it comes to physical features

of atmospherics, research has identified that they for land restaurants comprise aesthetics, ambience, lighting, table setting and layout, for example (Ryu *et al.*, 2012; Wall and Berry, 2007; Nyamekye *et al.*, 2021). We confirm the impact of those factors also for cruise ship dinescape, although in the cruise ship dinescape context lighting appeared as the most important atmospheric aspect. When it comes to the social features of the dinescape, our study echoes past studies when it comes to the importance of other guests and restaurant staff (Ryu and Jang, 2008). Yet, the findings clearly stress the essence of the cruise ship restaurant staff for positive experiences.

The present study offers numerous *managerial implications* for cruise service providers particularly in the post-pandemic era, as travellers are gradually being drawn to cruise vacations. While dinescapes are organized and staged service environments for dining experiences, the cruise ship features other organized settings for eating and drinking like barscapes, cocktailscapes and drinkscapes. These scapes can be themed and vary by decor, special effects and entertainment, conveying a certain atmosphere that will be sensed by the traveller. Cruise companies will benefit from acknowledging how positive emotions and quality satisfaction can be induced in both variety seekers and loyal cruise travellers. For example, dining restaurants should focus on the right lighting in tune with the theme of the dining venue, seating arrangements, tablescape and background music. This calls for a detailed analysis of on-board dinescape lighting design and deciding on the type of restaurant lighting (ambient, task and accent lighting) for creating an impression of clarity, spaciousness, relaxation, pleasantness and privacy aimed at the passengers (Durak, *et al.*, 2007). Travellers' interactions with other guests are an essential aspect of cruise vacations. Companies should pay special attention to the role of social interaction emerging among passengers. In a dinescape like the main dining venue, passengers are assigned to certain tables that vary in size, while these seating arrangements also serve as a platform for social interaction among diners. These interactions may induce positive emotions impacting positively the perceived dinescape quality simultaneously as memorable cruise experiences are created. We recommend cruise companies to pay special attention to seating arrangements to harmonize passengers and groups and to ensure positive experiences. A particular focus should be put on spatial crowdedness, as feelings of being stuck, confined, dense and lack of space influence emotions and behavioural intentions (Cakici *et al.*, 2021). What's more, given the importance of travellers' interactions with restaurant staff, the study's findings imply that cruise companies need to be vigilant and use every opportunity to spark positive interactions and to co-create memorable cruise experiences. Employees should be able to timely respond to customers' needs in the cruise service process. A carefully staged dinescape with flawless service interaction is instrumental for cruise companies to achieve a favourable platform for co-creating memorable cruise experiences and dining satisfaction. In the process of co-creation, cruise companies should encourage staff members to be active and in moments when there are suitable openings guide the restaurant guests in a professional way. In defining what is professional restaurant staff behaviour matching staff training programs should be implemented. The "non-loyal" dining behaviour among passengers may at first cause worries, but our findings show that there is no significant link between behaviour and satisfaction on the overall level. For management this implies that passengers' satisfaction with the restaurant dining options on-board cannot be measured by the means of on-board restaurant behaviour (choice of dining restaurants). Finally, cruise management deserve to acknowledge that a cruise ship comprises both organized and non-organized foodscapes, which all should be staged for the passengers.

This study has *limitations* that could be addressed by *future studies*. First, this study is based on a cross-sectional survey. Follow-up or longitudinal studies are necessary to measure dynamic changes in the experience dimensions studied. Second, this study took place on a single contemporary market cruise ship serving a specific area and was conducted among travellers with a Caribbean itinerary; as such, the results might differ on

cruise ships with different itineraries. For model validation, follow-up studies collecting empirical data from different cruise ships and various itineraries would also be welcome. Third, the statistical analysis technique adopted in the study was PLS-SEM modelling rather than covariance-based SEM, primarily because of the sample size.

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Appendix

Table A1 Heterotrait-monotrait ratio (HTMT)

	Atmos	*Table*	*Emo*	*Staff*	*Fbeh*	*Light*	*Seat*	*Music*	*OGuest*	*Qual*	*OBdin*	*CVsat*	*ODsat*
Atmos													
Table	0.863												
Emo	0.515	0.410											
Staff	0.659	0.675	0.516										
Fbeh	0.427	0.348	0.451	0.599									
Light	0.845	0.522	0.351	0.530	0.373								
Seat	0.842	0.492	0.416	0.345	0.278	0.372							
Music	0.556	0.318	0.265	0.209	0.171	0.472	0.426						
OGuest	0.550	0.473	0.519	0.595	0.350	0.340	0.584	0.188					
Qual	0.706	0.642	0.648	0.886	0.585	0.577	0.605	0.396	0.571				
OBdin	0.206	0.154	0.222	0.249	0.108	0.082	0.166	0.185	0.116	0.173			
CVsat	0.348	0.290	0.645	0.481	0.693	0.238	0.293	0.148	0.385	0.531	0.091		
ODsat	0.524	0.497	0.573	0.840	0.663	0.363	0.417	0.159	0.489	0.813	0.148	0.639	

Notes: Atmos = Atmospherics = Music; Table = Table setting = OGuest = Other guests; Emo = Emotions = Qual = Quality; Staff = Employees = OBdin = On-board dining behavior; Fbeh = Future behavior = CVsat = Cruise vacation satisfaction; Light = Lighting = ODsat = Overall dinescape satisfaction; Seat = Seating arrangements

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