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ARTICLE

The role of onboard experiencescape and social interaction in the formation of ferry passengers' emotions

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Abstract

This study has two primary objectives. The first is to examine whether and how the onboard experiencescape and the social interactions with the crew and other passengers affect passengers' emotions in the ferry context. The second objective is to adapt the experiencescape measurement instrument proposed by Pizam and Tasci (2019) and test its applicability and validity in maritime passenger transport services. Data were collected via questionnaire surveys conducted with 839 international ferry passengers and were analyzed using exploratory and confirmatory factor analyses as well as regression analyses. The findings, on the one hand, indicate that experiencescape and social interactions on board influence passengers' emotions, and on the other, they revealed the onboard experiencescape scale's structure and verified its applicability in the ferry shipping sector. A distinguishing feature of this work is that it measures and assesses passengers' emotions during the customer journey and not afterward based on a recall journey. Additionally, although academics have carried out extensive research on the impact of passenger interactions in services—there has been little quantitative analysis of this concept in the shipping industry—little research has been done to examine the social interaction with the crew and the social interaction with other passengers separately as two distinct constructs. Therefore, this study aims to fill this gap in the literature and empirically address the need to look at the interrelationships among the theoretical constructs under examination.

Keywords Experiencescape · Social interaction · Emotions · Ferry shipping · Passenger transport services · Maritime industry

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1 Introduction

Managing passengers' emotions in certain transport sectors is of the utmost importance (Herjanto et al. 2022; Song et al. 2020) since emotions play an integral part in influencing passengers' behavioral intentions (e.g., word-of-mouth, recommendations, and repurchase intentions) (Silva et al. 2021). According to Interferry, an international ferry trade association representing the ferry industry worldwide which participates with nongovernmental organization status in International Maritime Organization activities, in 2019, 4.27 billion passengers traveled on ferries whereas 4.5 billion passengers traveled on airplanes. Therefore, the contribution of the ferry industry to the passenger transport sector is unquestionable. So far, many case–control studies have examined passenger emotions in the airline sector (e.g., Han et al. 2021; Li et al. 2021; Wang et al. 2023) although far too little attention has been paid and much less is known about passengers' emotions in the passenger shipping industry (Mehta et al. 2021).

According to Radic et al. (2021), a key factor influencing passengers' emotions is their perception of the service environment. To assess the elements of the service environment, much conceptual and empirical research has been done. The first was conducted by Bitner (1992), who introduced to the literature the servicescape idea. While a rather good theoretical foundation has been built, the concept's nature has not been updated to reflect present perspectives on theories explaining customer,[1] employee,[2] and other stakeholder behaviors (Pizam and Tasci 2019; Tran et al. 2020). As a result, numerous researchers have "combed" the literature on servicescape and related concepts and coined the term experiencescape (Mei et al. 2020; Meng and Cui 2020), which refers to an expanded servicescape enhanced by the organizational culture of hospitality and the inclusion of employees as internal customers and service providers.

Experiencescape affects how passengers live the experience since it incorporates physical characteristics of the location, social actors and participants, organizational dynamics, and service delivery characteristics (Campos et al. 2018). The experiencescape assessment is also critical in transport services, as passengers spend more time in those services than in other services (Mossberg 2008). The ultimate objective of managers in passenger transport services is to guarantee that their customers enjoy amazing experiences because of their journey (Mei et al. 2020). For that reason, the better the experiencescape of their service is assessed, the better the formulation of their service can be in accordance with their passengers' needs.

Customers and employees may interact socially in the service environment, and customers may interact socially with one another (Lin and Mattila 2010). Therefore, the social interactions throughout a service can be categorized into social interaction with employees, also called customer-to-employee interaction, and social interaction

[1] The terms passengers and customers are used interchangeably throughout the article, since the customers in the ferry shipping industry are the passengers.

[2] The terms *employees* and *crew* are used interchangeably throughout the article, since the employees on board a vessel are the crew.

with other customers, also called customer-to-customer interaction (Ali et al. 2018; Tran et al. 2020). Although differences of opinion still exist, there appears to be some agreement that social interaction, in general, refers to the encounters between a customer and employees and other customers (Tran et al. 2020). Even if the experiencescape evaluates many elements of the service environment as well as the social context throughout the service, it does not examine separately as two distinct constructs the social interaction with employees and the social interaction with other customers (Pizam and Tasci 2019).

The purpose of this paper is on the one hand to examine the significance of the experiencescape and the social interaction (passenger-to-crew and passenger-to-passenger) in the formation of passengers' emotions during the journey in the ferry context and on the other to adapt the experiencescape measurement instrument proposed by Pizam and Tasci (2019) and test its applicability and validity in maritime passenger transport services. Therefore, it provides managers in passenger transportation and especially managers' in the passenger shipping industry with assessed measurement instruments, to test factors (e.g., onboard experiencescape, social interaction with crew, social interaction with other passengers, and emotions), that are academically documented that their amelioration can positively affect passengers' behavioral intentions (e.g., Gerou 2022; Wong and Lin 2022) and service's outcomes (Kim and Choi 2016).

The stimuli for the work described in this study were driven by a heightened awareness from academics that the experiencescape is an extended servicescape model, and much less is known about the relationship between emotions with the servicescape models (Tasci and Pizam 2020; Tubillejas-Andrés et al. 2020; Vigolo et al. 2020). Additionally, many scholars have viewed emotions as purely intrapersonal. Researchers challenge this viewpoint and highlight that there is abundant room for further progress in determining the way social interactions influence customers' emotions (Ali et al. 2018; Heinonen et al. 2018; Lin et al. 2018; Goldenberg et al. 2020; Manthiou et al. 2020). Lastly, throughout the examined literature, scholars emphasize the importance of a real-time journey assessment rather than a recall (Chepngetich et al. 2019; Manthiou et al. 2020; Spielmann 2021).

This paper is divided into five sections. In this section, the introductory part of the study is presented. Section 2 provides the theoretical background and hypothesis formation of this paper. Section 3 analyses the research methodology and design. Section 4 scrutinizes the results of this study, whereas in Sect. 5, the overall conclusions, limitations, and avenues for future research are presented.

2 Theoretical background and hypothesis formation

2.1 Emotions

Emotions are nuanced reactions to events (Niedenthal and Ric 2017). Intrapersonally, allow individuals to respond to significant events by influencing their cognition and attitude (Frijda 2004). Interpersonally, contribute to social coordination by eliciting emotional, inferential, and behavioral responses from others (Van

Kleef 2016). Consequently, emotions are communal processes, not solitary, individual ones (Mattila and Enz 2002), and they have a significant impact on our personal and social lives (Van Kleef and Lange 2020). Passengers create multiple experiences during their journey because they encounter numerous touchpoints (e.g., other passengers and crew). Emotions are the affective subjects, states, and experiences of individuals that influence their behavior (Amin et al. 2021). In other words, emotions are fundamental to the range and quality of human experiences (Dolan 2002) and behaviors (Amin et al. 2021). Several researchers have reported that emotions affect multiple stages of the passenger experience (Prayag et al. 2013) and play a crucial role in understanding their behavior (e.g. Choi and Choi 2019; Jiang 2019; Hoang 2020; Hosany et al. 2020); therefore, effectively managing passengers' emotions is of the utmost importance, in passenger transportation (Hoang 2020; Herjanto et al. 2022).

There are two basic theoretical perspectives in the literature on emotions: the dimensional and the categorical. The dimensional approach is valence-based, whereas the categorical approach refers to emotion specificity (Kujur and Singh 2018). In the services scientific literature, both the dimensional and the categorical theories are preferred for measuring emotions, although the categorical is the most widely used conceptualization in the bibliography.

As regards the dimensional theoretical perspective, academics measure emotions using two items, positive and negative emotions or pleasure and arousal. Summary dimensions, such as positive and negative emotions (Grappi and Montanari 2011) or pleasure and arousal (Zhang et al. 2017), are common, even though diverse studies employing a range of scales demonstrate that the content of emotions is highly variable. Researchers typically choose a restricted number of dimensions (categorical scales) in the categorical approach, such as positive and negative emotions, which appear to be the most widely used conceptualization (Laros and Steenkamp 2005).

The categorical scale of emotions is used for this research as it is the most applied measurement instrument in the services literature (Falter and Hadwich 2020; Tubillejas-Andrés et al. 2020; Van Kleef and Lange 2020). In this study, customers' emotions are measured by adopting Kujur and Singh's (2018) scale, which consists of two factors, positive emotions (contentment, happiness, love) and negative emotions (anger, fear, sadness, and shame).

2.2 Experiencescape

The experiencescape is the setting in which individuals generate their experiences as part of their mental process, considering the unique contexts, subjects, and physical objects and their sets of relationships (O'Dell 2006). The experiencescape concept is derived from the servicescape concept (Edvardsson et al. 2010). Servicescape was introduced in the literature in 1992 by Bitner and refers to the physical characteristics of an environment in which customers and employees interact.

Before Bitner's servicescape concept, researchers had tried to measure the influence of the environment on customers' behavior, but those studies concentrated on specific aspects (e.g., Areni and Kim 1993). The stimulus–organism–response (S–O-R) model designed by Mehrabian and Russell (1974) was the overarching

theory that Bitner used to create the servicescape concept (Tombs and McColl-Kennedy 2013). In the last two decades, the servicescape—consisting of the atmospheric (functional and sensorial), social, and natural components—attracted academics from a variety of sectors, resulting in a body of "scape" literature that expanded the concept's application (Pizam and Tasci 2019) to a variety of services (e.g., Bruwer and Gross 2017). In 2019, Pizam and Tasci expanded the multi-stakeholder servicescape concept by adding the cultural and hospitality culture components and introducing an extended servicescape model, named experiencescape, which is a stakeholder-centric concept. The experiencescape refers to the sensory, functional, social, natural, and cultural stimuli found in a service environment (Mei et al. 2020; Meng and Cui 2020), which contribute to an experience for various stakeholders and result in positive or negative cognitive, affective, and behavioral responses (Pizam and Tasci 2019). Based on those stimuli, Pizam and Tasci (2019) created the experiencescape measurement instrument, consisting of six factors (sensory, functional, social, natural, cultural, and hospitality culture).

The natural dimension of the model includes aspects—stimuli of the service landscape, the natural elements, and the balance between nature and the service environment (e.g., the building). Our study was conducted on board a vessel. For that reason, the natural dimension was excluded from the measurement instrument since the natural elements (e.g., the landscape) are not stable during a sea trip. According to Pizam and Tasci (2019), the natural dimension of their experiencescape measurement instrument is of particular significance only in specified geographic areas and places (shops, hotels, museums, etc.). More extensively, this dimension refers to building environments. Means of transport do not belong to this category, so this dimension was not incorporated in the measurement instrument of the experiencescape in this study.

The experiencescape scale of Pizam and Tasci (2019) is newly introduced in the bibliography. Only one article in the peer-reviewed literature examines this one-factor multidimensional experiencescape scale, with evidence from the accommodation tourism industry (Meng and Cui 2020). There is a growing body of literature that recognizes the importance of further examination of the experiencescape in different industries (e.g., Mei et al. 2020). Since no study was found that assesses it in the passenger transport sector and more specifically in a service environment where the natural stimuli are not stable and are constantly changing (e.g., ships, airplanes, trains, and buses), we posit the following:

H1: The onboard experiencescape can be measured through a multidimensional scale, reflecting the sensory, functional, social, cultural, and hospitality culture stimuli found in the service environment.

2.3 Social interaction

Even though the experiencescape assesses numerous aspects of the service environment as well as the social context throughout the service, it does not examine the social interaction with staff and the social interaction with other customers as two unique and distinct constructs (Pizam and Tasci 2019).

2.3.1 Social interaction with employees (crew)

According to the definition provided by Lin and Mattila (2010) and Tran et al. (2020), social interaction with employees is the contact between customers and service personnel that occurs during the service delivery process. Through the years, numerous researchers have emphasized the critical nature of customer engagement with the service personnel (Ali et al. 2018; Pizam and Tasci 2019).

More extensively, regarding the evolution of the concept of social interaction with employees in the literature, in 1993, Arnould and Price defined it as emotional effects connected with remarkable experiences rooted in connections between the consumer and the service provider. In 1996, Hartline and Ferrell defined interaction as the interface between employees and customers. In 2001, Ap and Wong highlighted the critical role of frontline personnel, whose performance directly impacts customer behaviors. In 2013, Zeithaml named this contact between the employees and the customers—in which several customer reactions are created—as "moments of truth." Also, in 2011, Walls et al. underlined the importance of human interaction with employees in services in addition to the physical environment features. As a result of the critical significance of employee engagement in services, most researchers have noted that employees' attitudes heavily influence customers' opinions of service performance, behavior, friendliness, and promptness (Ryu et al. 2012; Ali et al. 2018).

Even if the studies regarding the social interactions with employees are thriving theoretically among the services literature, there are very few studies in which the social interaction with employees is measured as a distinct construct and not holistically as a dimension of the entire social interaction process. By analyzing the examined literature on social interaction, two measurement instruments were traced in which the social interaction with employees is measured as a distinct construct. The first measurement instrument was created by Chang and Horng (2010) and comprises five items measuring social interaction with the service providers. In contrast, the second measurement instrument was created by Ali et al. (2018) and comprises four items measuring social interaction with the staff. The measurement instrument of Ali et al. (2018) is preferred in this study for assessing the social interaction with the employees (crew) since this construct is more applicable in the examined service environment.

2.3.2 Social interaction with other customers (passengers)

Numerous studies have repeatedly highlighted the important role of customer-to-customer interactions in the service outcomes, such as the perceived service quality, customer satisfaction, and loyalty (Moura e Sá and Amorim 2017; Tran et al. 2020).

More specifically, it is commonly accepted among scholars that a customer's behavior is influenced by the behavior of other customers (Walls et al. 2011). Rust and Cooil (1994) and Brady and Cronin (2001) discussed the significance of the interaction with other customers during the service delivery process. Through the years, researchers have examined the impact of other customers in a service environment from two different angles, the cognitive and the affective viewpoint (e.g., Ali et al. 2016). According to the cognitive viewpoint, the customer cognitively

evaluates the behavior and appearance of other customers in comparison to their own behavior and compares their behavior with other customers' behaviors (Huang and Hsu 2010). Regarding the affective viewpoint, it has to do with the emotional stimuli among customers. In other words, a customer's emotions are evoked by the emotions expressed by other customers in the same service environment (Tombs and McColl-Kennedy 2013).

However, few studies have investigated in depth the customer-to-customer interactions as a distinct construct of the overall social interaction; there has been little quantitative analysis of this concept. Unfortunately, customer-to-customer interaction remains a poorly defined term, with only one definition existing in the literature. According to the definition provided by Lemke et al. (2011), social interaction with customers is "*the perceived judgment of the superiority of customers' interaction with other customers.*"

Through the examination of the social interaction literature, it was discovered that only one measurement instrument existed in which the social interaction with other customers has been measured as an independent concept rather than as a dimension of the overall social interaction scale. This measurement instrument was created by Ali et al. (2016), and it has been enhanced with some extra variables by Ali et al. (2018). The measurement instrument of Ali et al. (2018) comprises four items that measure the social interaction with other passengers. More extensively, the scale is designed to assess the social interaction among the customers in the tourism transportation industry, and it is empirically examined in a few studies regarding tourism services.

2.4 Experiencescape and social interaction as critical factors that influence emotions

The measurement instrument for the experiencescape concept was introduced in the literature in 2019 by Pizam and Tasci. The authors highlight the need for further empirical investigation on the model and especially the influence of the holistic experiencescape on customers' emotions (affective responses). The literature search revealed many studies which theoretically examine the experiencescape impact on services (e.g., Fossgard and Fredman 2019; Mei et al. 2020; Piramanayagam et al. 2020). However, no previous study was found to investigate the impact of the experiencescape on passenger emotions in the ferry context. Additionally, the experiencescape is an extended servicescape model, and much less is known about the relationship between customers;' emotions with the servicescape models (Tubillejas-Andrés et al. 2020; Vigolo et al. 2020), with only one single study (e.g., Lin and Mattila 2010) existing that examines this relationship (servicescape and emotions) in the foodservice sector. According to academics, the amelioration of the experiencescape helps companies in the transport sector to elicit passengers' positive emotions (e.g., Torres et al. 2019; Radic et al. 2021).

Even while the experiencescape assesses many aspects of the service environment, it fails to evaluate in depth two essential factors that may influence the

emotions of customers: the social interaction between customers and personnel (Marinetti et al. 2011; Parkinson 2005).

Many researchers have seen emotions as entirely intrapersonal, although social processes also influence emotions (Manthiou et al. 2020). There is a dearth of empirical studies on the effect of social interactions on customers' emotions (Goldenberg et al. 2020). In the suggestions for future research of the examined literature, academics highlight the importance of examining social interactions throughout a service experience to determine the effect of those interactions on customers' emotions (Lin et al. 2018). The type and strength of the emotions experienced will vary depending on the social environment, and future studies should investigate how the social context impacts customers' emotions in more detail (Jung et al. 2017; Heinonen et al. 2018). In other words, how social interactions affect customer emotions has yet to be revealed.

Therefore, considering on the one hand the recommendations for more research attention on the impact of the experiencescape and the social interactions on emotions and on the other the absence of similar studies in passenger shipping services, in the current research, we hypothesize the following:

H2: Onboard experiencescape, social interaction with the crew, and social interaction with other passengers positively affect passengers' emotions.

3 Data and methods

3.1 Sample and data collection

A large-scale survey on the ferry shipping industry was conducted, on the itinerary Patra-Ancona and Ancona-Patra for two round trips (total selection from 4 itineraries). Each itinerary lasts 22–23 h. The random sampling methodology was employed, and a structured questionnaire was administered to almost 978 respondents. The data collection occurred in August 2021. The target respondents were passengers embarked on a RoPax ferry, assuring confidentiality and anonymity. The questionnaires had been prepared in three languages (English, Greek, and Italian), based on the assumption that the majority of the passengers are able to communicate in those languages.

The survey consists of two phases (phase A and phase B). In the phase A, passengers have to complete part 1. Part 1 aims to measure passengers' emotions, during the first half of the journey. In the phase B, passengers have to complete part 2 and part 3. Part 2 aims to measure passengers' emotions during the second half of the journey, and part 3 aims to assess the onboard experiencescape, the social interaction with the crew and the other passengers, and the personal characteristics of the passengers.

A total of 977 participants completed the questionnaires. A number of 138 participants were excluded from the study due to uncompleted questionnaires or irresponsible answers, thus the final sample size $N=839$. In terms of gender, 54.2 percent were male, 45.1 percent were female, and 0.7 percent were non-binary, with an age ranging from 16 to 83 years, with a mean of 49.57 years. Respondents represented a wide range of nationalities, with Greeks (40.2 percent) and Germans (21.1 percent) constituting the majority. Table 1 displays the demographics of the respondents.

Table 1 Demographic profile of the respondents

Variable	Category	Frequency	Percentage
Gender	Male	454	54.2
	Female	379	45.1
	Non-binary	6	0.7
Age	Below 24	32	3.9
	24–33	138	16.4
	34–43	111	13.2
	44–53	184	21.9
	54–63	176	21.0
	64–73	165	19.7
	73 and above	33	3.9
Nationality	Greek	338	40.1
	German	177	21.1
	Italian	66	7.8
	Swiss	54	6.3
	French	51	6.1
	Other European countries	144	17.5
	Others	9	1.1

3.2 Methodology

Cronbach's alpha was used to determine the data's reliability. In all the examined constructs, the Cronbach's alpha value is above 0.7 (emotions (0.797 stage A, 0.827 stage B), social interaction with employees (0.914), social interaction with other customers (0.795), and experiencescape (0.811)), indicating a very satisfactory level of construct reliability.

Even if there is a robust study assessing the experiencescape scale of Pizam and Tasci (2019) (e.g., Meng and Cui 2020), the item that reflects the natural stimuli was not incorporated in the scale of this study. Therefore, an exploratory factor analysis (EFA) using the IBM SPSS (version 27) software was conducted to refine the scale items and reveal the structure (Hair et al. 2006) of the onboard experiencescape.

Confirmatory factor analysis (CFA) using the IBM SPSS AMOS (version 26) was also performed. Firstly, in the experiencescape construct to validate the EFA results further and test the (H1) Research Hypothesis 1. Secondly, in the emotions, social interaction with the crew, and social interaction with the other passengers constructs to refine the scales and confirm their dimensionality. CFA was conducted as the measurement instruments of the constructs mentioned above (emotions, social interaction with crew, social interaction with other passengers) have been widely used in the literature, and their applicability has been confirmed in services by various researchers (e.g., Majra et al. 2016; Medina-Muñoz et al. 2018; Wozniak et al. 2018).

The (H2) Research Hypothesis 2 was assessed through regression analysis.

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4 Results

4.1 Test of research hypothesis 1 (H1)

An exploratory factor analysis using principal axis factoring was conducted to reveal the dimensionality of the scale of the onboard experiencescape. Before running the analysis, it must be checked if it makes sense to conduct factor analysis on the correlation matrix. This question was answered by checking the results from Barlett's test and the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO-MSA) (Hair et al. 2006). In this EFA, Barlett's test is significant (p value < 0.05), so this indicates that it is appropriate to factor analyze the matrix (as significance indicates that the sample correlation matrix is significantly different from an identity matrix). KMO-MSA (KMO-SMA = 0.783; KMO-SMA > 0.5) also indicates that the matrix is acceptable for factoring. According to Kaiser and Rice's (1974) terminology, the factorability of this matrix is considered "middling" to "meritorious."[3] Also, there is no multicollinearity since the determinant of the correlation matrix (determinant = 0.088) is greater than 0.00001 (Field 2018).

As a result, this construct can be factor analyzed. The EFA results showed (see Table 2) that only one factor characterizes the onboard experiencescape measurement instrument. Due to these findings, a confirmatory factor analysis (CFA) will then be conducted to confirm the number of the dimensions of the experiencescape construct in the ferry context.

[3] KMO-MSA (> 0.5 (miserable), > 0.6 (mediocre), > 0.7 (middling), > 0.8 (meritorious), > 0.9 (marvelous)).

Table 2 Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.339	47.705	47.705	2.804	40.054	40.054
2	0.980	13.997	61.702			
3	0.841	12.016	73.718			
4	0.733	10.478	84.196			
5	0.487	6.957	91.153			
6	0.388	5.540	96.693			
7	0.231	3.307	100.000			

Extraction method: principal axis factoring

CFA was employed using the maximum likelihood estimation to confirm the structure of the onboard experiencescape, emotions (in stage A and stage B), social interaction with crew, and social interaction with other passengers constructs.

All standardized regression weights (see Appendix) are statistically significant, confirming the convergent validity of the measurement models. The absolute and incremental fit indices are highly satisfactory and thus signify a very good fit. All the Chi-square/df ratios fall within the acceptable range of 0–5 (Tatoglu et al. 2016). The root mean square errors of approximation (RMSEA) are below 0.07 (Steiger 2007), while the goodness of fit statistics (GFI), the adjusted goodness of fit statistics (AGFI), the comparative fit index (CFI), the normed fit index (NFI), and the non-formed fit index (NNFI), also known as the Tucker–Lewis index (TLI) values, are very close to 1. The GFI and AGFI values greater than 0.9, and the NNFI (TLI), NFI, and CFI values greater than 0.95 (Hooper and Mullen 2008) indicate a very good model fit. As a result, the goodness of fit statistics are highly satisfactory and thus confirm the good measurement properties of all the examined instruments.

The above CFA findings indicate the following:

- The onboard experiencescape is expressed as one distinct dimension composed of seven items that, according to the CFA, indicate a very good model fit. Therefore, the (H1) Research Hypothesis 1 is supported. So, the onboard experiencescape can be measured through a one-factor multidimensional scale, reflecting the sensory, functional, social, cultural, and hospitality culture stimuli found in the service environment.
- Passengers' emotions in both stages are composed of two distinct dimensions (CFA in both stages indicates a very good model fit). The first one (positive emotions) expresses the passengers' positive emotions, whether they feel contentment, happiness, or love. In contrast, the second one (negative emotions) expresses the passengers' negative emotions, whether they feel angry, sad, fearful, or ashamed.
- Social interaction with the crew is expressed as one distinct dimension composed of four items that, according to the CFA, indicate a perfect model fit.
- Social interaction with other passengers is expressed as one distinct dimension composed of four items that, according to the CFA, indicate a very good model fit.

4.2 Test of research hypothesis 2 (H2)

Multiple regression analysis was used to assess the impact of social interaction and experiencescape on passengers' emotions and test the second hypothesis. Multiple regression was preferred since the vast majority of the examined articles in the emotions literature used this technique to test the relationship between a single dependent variable and several independent variables (e.g., Kujur and Singh 2018; Goldenberg et al. 2020). The dependent variable is passengers' emotions during the journey as expressed by the mean of emotions at stage A (aggregated measure after summing the two dimensions of emotions at stage A (positive and negative emotions)) and emotions at stage B (aggregated measure after summing the two dimensions of emotions at stage B (positive and negative emotions)). To calculate the emotions score in each stage negative emotions were recoded into the same variable as positive emotions since the variables for the positive emotions are worded positively (e.g., *I feel happy*) whereas for the negative emotions are worded negatively (e.g., *I feel sad*). The sum in each of the two dimensions of the social interaction (interaction with the crew and interaction with other passengers) and the sum of experiencescape are used as independent variables.

Emotions were assessed using seven items, organized in two axes [a. positive and b. negative emotions] (Kujur and Singh 2018). The first three items reflected positive emotions (contentment, happiness, and love), whereas the last four measured negative emotions (anger, fear, sadness, and shame). These dimensions were specifically selected as they have been extensively used for emotional evaluation in the services bibliography (Falter and Hadwich 2020; Cachero-Martínez and Vázquez-Casielles 2021). The variable of pride was excluded from the positive emotions dimension since the reliability statistics of this variable were not among the acceptable values. Passengers' emotions were measured twice (in the first half of the journey (stage A) and in the second half of their journey (stage B)) in order to have a valid insight and a meaningful understanding of their emotional experience onboard.

The measurement instrument of social interaction with the staff (one-dimensional instrument with four items) developed by Ali et al. (2018) was adopted to measure the social interaction with the crew. The measurement instrument of social interaction with other customers (one-dimensional instrument with four items), also created by Ali et al. (2018), was used to measure the social interaction with other passengers.

The experiencescape instrument proposed by Pizam and Tasci (2019) was adapted to measure the onboard experiencescape. This measurement instrument was specifically selected as it has been used for experiencescape evaluation in services, according to the examined bibliography (Meng and Cui 2020). Regarding the

Table 3 Multiple regression—ANOVA[a]

	Df	Sum sq	Mean sq	*F* value	*p* value
Regression	3	10,359.788	3453.263	119.249	0.000[b]
Residual	836	24,209.212	28.958		
Total	839	34,569.000			

[a]Dependent variable: passengers' emotions

[b]Predictors: (constant), experiencescape on board, social interaction with crew, social interaction with passengers

conceptualization of the experiencescape concept, the scale draws upon the servicescape concept (Bitner 1992) enhanced with the social component (Tombs and McColl-Kennedy 2010), the cultural component (Rosenbaum 2005), the natural component (Rosenbaum and Massiah 2011), and the hospitality culture component (Pizam and Tasci 2019). This study was conducted on board a ship; for that reason, the natural dimension was excluded since the natural elements are not the same during a sea trip. The one-factor multidimensional experiencescape scale used in this study comprises seven items, which measure the sensory (hedonic), functional (utilitarian), social, cultural, and hospitality culture stimuli of the examined service environment.

All the items in the examined constructs were measured on a seven-point Likert-type scale ranging from "strongly disagree" to "strongly agree."

Before running the regression analysis, regression assumptions had been tested [the relationship between the independent and dependent variable is linear (valid), there is no multicollinearity (valid), the values of the residuals are independent (valid), the variance of the residuals are constant (valid), residuals are normally distributed (valid)]. As far as the regression assumptions had been clarified, the regression analysis was conducted.

According to the analysis results, the model is statistically significant [$F(839) = 119.246$ and p value < 0.05], which means at least one coefficient differs from zero significantly (see Table 3). The onboard experiencescape, the social interaction with the crew, and the social interaction with other passengers can interpret 29.7% of the passengers' emotion variability (see Table 4).

As can been seen from the data in Table 5, the model includes the constant coefficient, which is significant (t value = 12.882, p value < 0.05) and indicates significance for experiencescape (t value = 6.417, p value < 0.05), social interaction with the crew (t value = 6.131, p value < 0.05), and social interaction with the other passengers (t value = 6.122, p value < 0.05).

Consequently, (H2) Research Hypothesis 2 has been supported, verifying that the experiencescape, the social interaction with the crew, and the social interaction with other passengers positively affect passengers' emotions during the journey in the ferry context (see Fig. 1). The model equation is formulated as follows: Passengers' Emotions = 15.139 + 0.260*Experiencescape on board + 0.362*Social interaction with crew + 0.290*Social interaction with other passengers + e.

5 Conclusions

The primary objective of the current study was to examine whether and how the onboard experiencescape and the social interactions with the crew and other passengers affect passengers' emotions in the ferry context. This study set out with the aim of assessing emotions during the journey and not afterward based on a recall journey.

Table 4 Model summary

Model[a]	R	R^2	Adj. R^2	SEE
1	0.547[b]	0.300	0.297	5.38130

[a]Dependent variable: passengers' emotions

[b]Predictors: (constant), experiencescape on board, social interaction with crew, social interaction with passengers

Table 5 Coefficients of multiple regression

Model [a]	Unstandardized coefficients		Standardized coefficients	*T* value	*p* value
	B	Std. error	*β*		
(Constant)	15.391	1.195		12.882	0.000
Experiencescape on board	0.260	0.040	0.260	6.414	0.000
Social Interaction with crew	0.362	0.059	0.234	6.131	0.000
Social Interaction with passengers	0.290	0.047	0.193	6.122	0.000

[a]Dependent variable: passengers' emotions

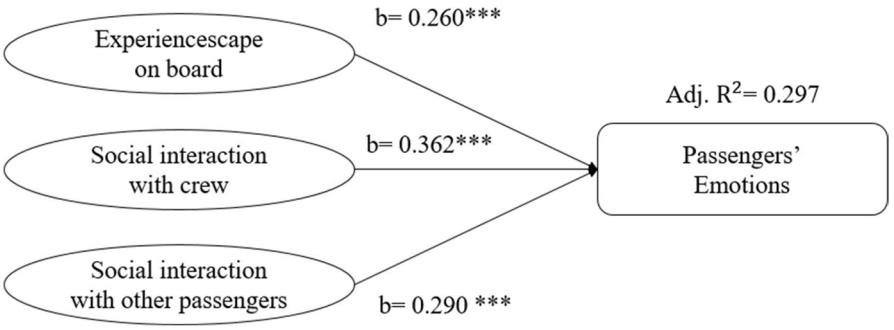

Fig. 1 Experiencescape on board, social interaction with crew and social interaction with other passengers—passengers' emotions relationship

Emotions play an integral part in influencing passengers' behavioral intentions and many studies so far have underlined the significant relationship between emotions and passengers' future behavioral intentions (e.g., Silva et al. 2021). Previous research has reported that emotions affect behavioral intentions such as loyalty, patronage, recommendation intentions, and word-of-mouth (Das and Varshneya 2017; Ou and Verhoef 2017; Geng and Li 2018; Harrison-Walker 2019). So far, however, there has been little discussion about indicators that affect passengers' emotions and regarding the shipping industry, studies have not dealt with factors that influence the passengers' emotions, which in turn affect their behavioral intentions. To bridge this gap, this study proposes to explore the influence of experiencescape and social interactions with crew and other passengers on passengers' emotions.

As regards the adapted experiencescape scale (Pizam and Tasci 2019), no single study was found that assesses it in the passenger transport sector and more specifically in a service environment where the natural stimuli are not stable and are constantly changing such as a vessel. Additionally, although academics have carried out extensive research on the impact of passenger interactions in services- there has been little quantitative analysis of this concept in the passenger shipping industry-, little research has been done to examine the social interaction with the crew and the social interaction with other passengers separately as two distinct constructs.

In summary, the results of this study indicate that the experiencescape and the social interaction with employees and other passengers strongly impact passengers' emotions during their journey.

5.1 Managerial implications

This research provides useful implications for the managers of passenger shipping companies. Firstly, managers in the ferry context who intend to enhance their customers' emotional experience, and as a result ameliorate their behavioral intentions, must assess and improve on the one hand, their service's experiencescape and on the other, the social interactions throughout the service. Secondly, it provides practitioners in the passenger shipping industry with an empirically assessed tool for the evaluation of the onboard experiencescape. This tool is a one-factor multidimensional scale (adaptation of the experiencescape measurement instrument proposed by Pizam and Tasci 2019) reflecting the sensory, functional, social, cultural, and hospitality culture stimuli found in the service environment onboard and consists of seven items ("*The atmosphere is appealing to my senses*," "*The design and layout are functional*," "*The crowd level is comfortable*," "*The passengers are sociable*," "*The crew are friendly*," "*The overall culture is welcoming to me*," and "*This shipping company shows hospitality to the passengers*"). Also, this study revealed that social interactions among the crew and other passengers are critical indicators of the passengers' emotional formation and significantly impact their emotional experience. As a result, when it comes to social interaction assessment in the ferry context, managers should examine both types of interactions (passenger-to-crew and passenger-to-passengers interactions), since they both strongly impact the "sign" (positive or negative) of their passengers' emotional experience.

5.2 Limitations and suggestions for future research

Since several questions remain unanswered at present, there is abundant room for further progress. What is not yet clear, is how passengers' past emotional experiences during a journey may affect their emotions in future journeys. Further research should be done to investigate how the usage of technology (e.g., electronic devices (tablets, mobile phones, etc.)) and wearables (e.g., smartwatches, headphones, and earbuds) onboard may affect passengers' social interactions. Also, the impact of the traveling companion (e.g., the passenger is traveling alone and with friends and/or colleagues) and the reason for traveling (e.g., business, leisure, visiting family or friends, etc.) on the passengers' social interactions must be examined. Since this study does not assess the variables mentioned above, further studies that take these variables into account will need to be conducted. Lastly, although this paper provided some practical contributions, the authors believe closer examination needs to be done in order to support the generalizability of the results. More specifically, this study focuses on the passenger shipping industry, more research is required to determine the efficacy of the onboard experiencescape measurement instrument in passenger transportation. It is recommended that further research be undertaken in the following areas: fixed-track transport services, air transport services, and land transport services.

Appendix

Table 6 Standardized regression weights

Factors	Standardized regression weights*	
	Estimations	
Social interaction with crew		
The crew and officers provide a thorough and satisfactory service	0.818	
The crew and officers are reliable	0.767	
The crew and officers are professional	0.888	
The crew and officers have a good knowledge of the service provided	0.895	
Social interaction with other passengers		
The other passengers are loud	0.633	
The other passengers behave nicely	0.540	
The other passengers seem to be problematic	0.839	
The other passengers create a disturbance	0.926	
Experiencescape on board		
The atmosphere is appealing to my senses	0.511	
The design and layouts is functional	0.521	
The crowd level is comfortable	0.497	
The passengers are sociable	0.503	
The crew and officers are friendly	0.745	
The overall culture is welcoming to me	0.796	
This shipping company shows hospitality to the passengers	0.714	
Emotions		
Positive emotions	Stage A	Stage B
I feel contentment (contended, peaceful, fulfilled)	0.533	0.783
I feel happy (optimistic, pleased, thrilled, enthusiastic)	0.739	0.870
I feel love (romantic, sentimental, warm-hearted)	0.803	0.528
Negative emotions	Stage A	Stage B
I feel angry (frustrated, irritated, unfulfilled)	0.635	0.851
I feel sad (depressed, miserable, helpless)	0.584	0.798
I feel fear (scared, afraid, worried, nervous)	0.871	0.507
I feel ashamed (embarrassed, ashamed, humiliated)	0.598	0.612

*$p < 0.001$

Declarations

Competing interests The authors declare no competing interests.

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