

Co-creating customer experiences in service ecosystems: a study in a tourist destination

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Abstract

Purpose – This study aims to examine the co-creation of customer experiences at different levels in service ecosystems, analyzing the case of a tourist destination.

Design/methodology/approach – A questionnaire was designed based on previously validated scales. The questionnaire was distributed through the social media platforms Facebook and Instagram. The survey yielded 1,476 valid responses for three types of destinations. Structural equation modeling and multigroup analysis were performed to test the hypotheses.

Findings – Aggregate service experience and memorable customer experience (MCE) in service ecosystems are determined by customer experiences at a dyadic level. Service experience at the ecosystem level is formed from ordinary experiences at the actor level, while MCE is formed from extraordinary experiences at the dyadic level. The type of ecosystem moderates the relationships between the variables but does not alter the importance of each of them.

Originality/value – The relationship between the co-creation of customer experiences at different levels of service ecosystems (dyadic vs aggregate) is addressed. A relationship is established between the ordinary and extraordinary character of experiences and their memorability at the ecosystem level.

Keywords Service ecosystem, Experiences co-creation, Service experience, Memorable customer experience, Tourist destination

Paper type Research paper

1. Introduction

The service ecosystem has emerged from service-dominant (S-D) logic as an important concept to explain the communal provision of a service by a network of actors (Vargo and Lusch, 2016; Mustak and Plé, 2020; Vargo *et al.*, 2023). Nowadays, it is quite usual for the delivery of a service to require the participation of various actors, such as at tourist destinations, shopping malls, airports, or hospitals. According to Mustak and Plé (2020), this topic has been studied from a very optimistic conceptual point of view, which has overlooked the complexity involved in the creation of value by a network of actors: agents may seek to maximize their own interests to the detriment of others, or interactions between actors may be decoupled.

Mutual value-co-creation is one of the key service ecosystem principles postulated by S-D logic (Vargo and Lusch, 2016; Mustak and Plé, 2020; Landry and Furrer, 2023). Customer value creation is the goal of service providers and of the ecosystem. However, the complexity of the value creation process in a network that operates at micro, meso and macro levels and where individual and collective objectives may diverge means that value outcomes may vary from co-creation to co-destruction (Mustak and Plé, 2020; Barrios *et al.*, 2023; Landry and Furrer, 2023). To generate value, each actor in the network uses its own resources as well as those provided by the context (Gardiazabal

and Bianchi, 2021). Despite the importance of this perspective, multilevel co-creation value outcomes in a service ecosystem have deserved little empirical attention by researchers (Mustak and Plé, 2020; Gardiazabal and Bianchi, 2021; Sukla *et al.*, 2023; Vargo *et al.*, 2023; Landry and Furrer, 2023).

This paper focuses on the main outcome of value co-creation: customer experience. The literature about customer experience differentiates between service experience and memorable customer experience (MCE), because the generation of memorable experiences has become a priority for services (Moliner *et al.*, 2023). S-D logic postulates that different service providers create their own experiences but also contribute to generating ecosystem aggregate experience. Despite the importance of this approach, to the best of the authors' knowledge, the literature has yet to explore service experience and MCE from the perspective of a service ecosystem (Hosany *et al.*, 2022).

The case under analysis is tourist destinations, which constitute a service ecosystem in which firms and institutions interact with tourists in a given location to co-create value. In the process of co-creation, the actors of the tourist destination

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This work is supported by the AICO/2020/074 project of the Generalitat Valenciana (Spain) for consolidated research groups.

Received 11 September 2023

Revised 29 November 2023

Accepted 8 January 2024

The current issue and full text archive of this journal is available on Emerald Insight at: <https://www.emerald.com/insight/0887-6045.htm>



Journal of Services Marketing
Emerald Publishing Limited [ISSN 0887-6045]
[DOI 10.1108/JSM-09-2023-0334]

contribute their own resources and activities, have institutional arrangements and take advantage of public resources and those of other actors (Gardiazabal and Bianchi, 2021; Landry and Furrer, 2023). The tourist's experience with the destination is an outcome of the dyadic interactions that occur at the actor level throughout the consumer journey. In this paper, we study the impact on tourist destination experiences of two of the most important areas of service provision: accommodation and local food (Ye *et al.*, 2021).

The aim of this study is to examine the co-creation of customer experiences at different levels in a service ecosystem by analyzing the case of a tourist destination. More specifically, we study three research questions:

RQ1. How does the co-creation of experiences at the customer–actor dyadic level influence the generation of customer experiences at the ecosystem aggregate level?

RQ2. What is the relationship between service experience and MCE at the ecosystem aggregate level?

RQ3. What moderating role does the type of service ecosystem play in generating customer experiences?

The paper is structured as follows. In the next section, we present the theoretical background of the co-creation of customer value in service ecosystems. The hypotheses are then proposed, and the moderating variables are defined. Section 3 describes the questionnaire design, together with the size and characteristics of the sample. A survey was designed that yielded a final sample of 1,476 valid responses from Spanish tourists. In the results section, confirmatory factor analysis (CFA) is performed to analyze the dimensionality, reliability and validity of the scales and structural equation modeling (SEM) is applied to test the hypotheses. The paper ends with a discussion, findings, managerial recommendations and limitations of the study.

2. Theoretical background: service ecosystems

S-D logic defines a service ecosystem as a “relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangement and mutual value creation through service exchange” (Vargo and Lusch, 2016). S-D logic establishes four key terms that characterize service ecosystems:

- 1 actors (entities that integrate resources and engage in exchanges);
- 2 service (the process by which one actor uses its resources to generate benefits for another);
- 3 value (a positive or negative change in the viability of a system); and
- 4 institutional arrangements (set of rules, regulations, practices and values that enable collaboration between actors and enable value-co-creating actions) (Vargo *et al.*, 2023).

Value co-creation is the main objective of the ecosystem and entails resource integration and service exchange between the actors (Vargo *et al.*, 2023). A tourist destination is understood as a network of firms and institutions that participate in and collaborate to co-create value for the tourist in a given location. On the business side, there are the public and private service providers that participate in the consumer journey at the

destination, while the institutions are the set of rules, regulations, practices and values that enable collaboration between them.

When literature refers to customer experiences, it distinguishes between service experience and MCE (Kim *et al.*, 2012; Kim, 2014; Kim and Chen, 2020; Moliner *et al.*, 2023). Service ecosystems make value propositions that consumers transform into experiences throughout their interactions along the consumer journey. Klaus and Maklan (2012) coined the term service experience to define the evaluation of the processes before, during and after the experience. In the case of a service ecosystem, it refers to the customer's assessment of the dyadic interactions with the network of actors involved in a tourist destination. Klaus and Maklan (2012) argue that the roots of service experience lie in service quality: service quality is eminently cognitive, while service experience incorporates personal value and affects customer evaluation. These authors propose four dimensions of service experience:

- 1 peace of mind (emotional aspects of service related to the perceived expertise of the service providers);
- 2 outcome focus (reducing customers' transaction costs);
- 3 moments of truth (service recovery and flexibility); and
- 4 product experience (customers' perception of having choices and the ability to compare offers).

However, in reality, achieving a satisfactory service experience is not enough to build customer loyalty – it has to be memorable (Kim, 2014). According to Sthapit and Jimenez-Barreto (2018), MCE is generated through service experiences that are positively remembered and evoked (Kim *et al.*, 2012). Following Kim and Chen (2020) and Sharma *et al.* (2022), MCE can be defined as a significant event that is accumulated in the memory of the customer and can be evoked later. MCE is easier to evoke and more difficult to forget, and it becomes the most important source of information influencing the customer's future behavior (Ye *et al.*, 2021; Sharma *et al.*, 2022). A high level of memorability facilitates memory vividness and is a key antecedent of loyalty behaviors (Ye *et al.*, 2021). From the service ecosystem perspective, MCE is a consequence of the customer's evaluation of the value co-created in the ecosystem based on dyadic interactions with the service providers throughout the consumer journey.

The service ecosystem paradigm considers that on-site experiences are generated through the dyadic interactions between the customers and the actors (Stamboulis and Skayannis, 2003; Kim, 2018). From the MCE perspective, it is important to distinguish between ordinary and extraordinary experiences (Ye *et al.*, 2021). Ordinary experiences of a destination meet the customer's basic needs, as in the case of accommodation, food and transportation services (Qan and Wang, 2004; Ye *et al.*, 2021). For Ye *et al.* (2021), extraordinary experiences, linked to multisensory elements, fantasy and emotional aspects, are what generate MCE: customers seek to satisfy their hedonic needs through experiences that go beyond simply finding solutions to everyday problems in the destination.

2.1 Relationships between different levels of customer experiences in service ecosystems

In service ecosystems, therefore, two types of experiences (service experience and MCE) can be generated, and two levels of relationships (dyadic and aggregated) must be considered.

Regarding the relationship between service experience and MCE at the aggregate level, some studies have found a direct and positive relationship between service experience and MCE. According to [Ye et al. \(2021\)](#), the service experience must include extraordinary aspects for MCE to be generated, which implies that MCE is not always an outcome. Similarly, [Williams et al. \(2020\)](#) distinguish between memorable experiences and frictionless experiences, associated with emotional attachment and functional satisfaction, respectively. [Prentice et al. \(2022\)](#) consider that for a service experience to be memorable, it must be innovative and able to generate affective emotions during the cognitive process. Recently, [Roggeveen and Rosengren \(2022\)](#) have stressed the importance of the human experience, because if a service connects with the customer's central ambitions, beliefs, values and/or feelings, maximum levels of experience can be reached. Therefore, the service experience is a necessary condition for MCE but is not sufficient on its own. We therefore posit a direct causal relationship between service experience and MCE at the aggregate level:

H1. The service experience directly influences MCE at the aggregate level.

A service ecosystem is a network of actors collaborating to co-create customer experiences. Each actor generates experiences through dyadic interactions with the customer. However, collaboration with the other actors is necessary for the ecosystem to function in a coordinated manner and for the customer to have a full experience. Co-creation therefore implies interdependence, because an outcome is determined not only by one's own actions but also by those of partners, and vice versa ([Sukla et al., 2023](#); [Le et al., 2023](#)). For a service ecosystem to achieve satisfactory results at the aggregate level, it must pay attention to structural aspects (goal, power, rules and coordination structures) and to behavioral elements (display of team-like behaviors such as progress monitoring, information exchanging or cooperating with one another) ([Le et al., 2023](#)).

For a tourist destination, two of the most important actors in service provision are food and accommodation ([Qan and Wang, 2004](#)). Both actors, along with others present at the destination, are responsible for co-creating value and generating satisfactory experiences for tourists. Several studies highlight the importance of food in destination service experiences because it has an impact on the quality tourists perceive and their satisfaction ([Stone and Migacz, 2016](#); [Stone et al., 2018](#); [Ye et al., 2021](#); [Pham et al., 2023](#)). Food is one of the criteria considered when choosing a destination, especially in the case of gastro-tourists, who plan their trips, at least in part, around trying local food and having authentic experiences associated with the local or regional gastronomy ([Williams et al., 2019](#)). But even among tourists who are not especially motivated by the destination's gastronomic offer, food influences their evaluation of the travel experience ([Björk and Kauppinen-Räsänen, 2016](#)). Eating is a basic human need that tourists must satisfy in their chosen destination, and as such, it can be regarded as an ordinary experience ([Gupta and Sajjani, 2020](#); [Ye et al., 2021](#)).

In recent years, increased attention has been paid to local food because of the impact it has on destination sustainability.

Local food can be defined in three domains ([Brune et al., 2021](#)):

- 1 geographical proximity between food production, distribution and consumption;
- 2 relational proximity between local actors; and
- 3 values of proximity in terms of authenticity, freshness and/or quality.

Local food is popularly understood as the use of locally sourced ingredients. Food and local food affect the destination service experience because of their ordinariness: before the trip (as part of the attractions of a destination valued by tourists), during the stay (as a necessary part of the tourist's daily routine and a major part in their expenditure) and after the trip (local food as a souvenir) ([Björk and Kauppinen-Räsänen, 2016](#)):

H2. The local food experience directly influences the tourist destination service experience.

Together with food and transportation, accommodation is a basic need that must be met whenever tourists travel ([Ye et al., 2021](#)). A large part of the academic literature focuses on identifying which accommodation characteristics influence tourists' decisions ([Sthapit and Jimenez-Barreto, 2018](#); [Moliner et al., 2019](#)). Accommodation is a basic, ordinary aspect of travel planning, representing a significant proportion of the tourist's expenditure and meeting their basic need for somewhere to rest ([Fesenmaier and Jeng, 2000](#); [Sthapit and Jimenez-Barreto, 2018](#)). Accommodation is therefore a crucial element in evaluating the destination service experience ([Sharpley, 2000](#); [Sohrabi et al., 2012](#)). Perceived quality of and satisfaction with accommodation generate ordinary experiences that affect the destination service experience ([Moliner et al., 2019](#); [Ye et al., 2021](#)):

H3. The accommodation experience directly influences the tourist destination service experience.

These three hypotheses suggest that the service ecosystem experience plays a mediating role in the relationship between service providers and MCE. However, actually, customers are looking to satisfy their hedonic needs rather than simply resolving everyday problems ([Ye et al., 2021](#)). Accommodation and local food are therefore involved in both ordinary (ecosystem service experience) and extraordinary (MCE) experiences.

Various studies have examined the direct relationship between food and MCE ([Lashley et al., 2004](#); [Sutton, 2010](#); [Stone et al., 2018](#)). [Stone et al.'s \(2017\)](#) qualitative study explored the relationship between local food and MCE, concluding that local food and authentic food are memorable aspects for tourists. Part of the uniqueness of local food lies in its origins in the local culture and its history, and another part attaches to its links to the local socio-economic and environmental system ([Björk and Kauppinen-Räsänen, 2016](#)). [Lee \(2023\)](#) conceptualized food memories as an intangible cultural heritage: "a form of cultural expression that transcends the food's physical properties to include the cultural symbolic properties of narratives, traditions, embodied knowledge, and memories that thread past to present" (p. 1). Local food not only provides essential sustenance to tourists but also has a hedonic, inspirational, emotional and pleasure-inducing element that

affects MCE (Björk and Kauppinen-Räsänen, 2016; Sthapit, 2018; Stone *et al.*, 2018; Gupta and Sajani, 2020; Hosany *et al.*, 2022; Lee, 2023; Pham *et al.*, 2023):

H4. The local food experience influences MCE at a destination.

While accommodation meets the tourist’s basic need for rest and generates ordinary experiences, it can also give rise to extraordinary experiences (Ye *et al.*, 2021). In this line, Sthapit (2018) identified three dimensions that make a hotel stay memorable: a comfortable room, the friendly attitude of hotel staff and a delicious breakfast. Other studies have identified memorable elements in different types of accommodation in different types of destinations (Sipe and Testa, 2018; Mody *et al.*, 2017; Harkison *et al.*, 2018; Sthapit and Jimenez-Barreto, 2018; Ye *et al.*, 2019). As with local food, accommodation has a hedonic element that can arouse emotions, surprise and pleasure for the tourist:

H5. The accommodation experience influences MCE at a destination.

Figure 1 shows the model we will analyze.

2.2 Moderation variables

One question arising from the hypotheses development and the service ecosystems approach is whether or not the drivers of MCE are the same in any type of ecosystem (sun and sand destination, rural destination and urban destination). The moderating role of destination type is attracting increasing research attention (Rasoolimanesh *et al.*, 2017; Segota *et al.*,

2022; Yang *et al.*, 2022; Moliner *et al.*, 2023). The purpose of the network of firms and institutions making up the service ecosystem is to combine available resources to create, distribute and capture customer value (Osterwalder and Pigneur, 2010). The service ecosystem perspective implies that service providers play a key role in the customer experience.

A tourism destination is:

[...] physical space with or without administrative and/or analytical boundaries in which a visitor can spend an overnight. It is the cluster (co-location) of products and services, and of activities and experiences along the tourism value chain and a basic unit of analysis of tourism. A destination incorporates various stakeholders and can network to form larger destinations. It is also intangible with its image and identity which may influence its market competitiveness (UNWTO, 2017).

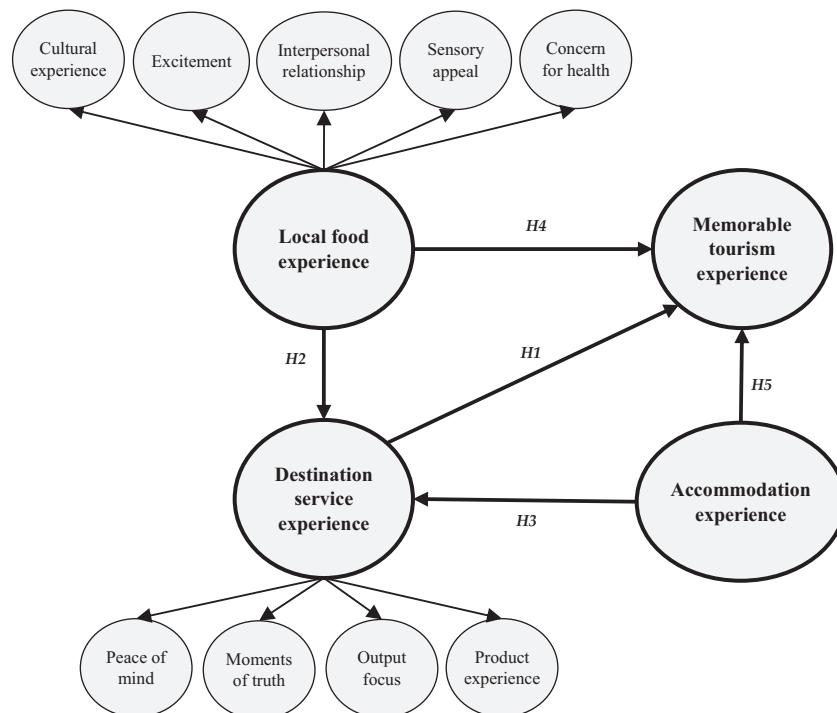
Tourism destination typologies are differentiated by their combinations of products, services, activities and experiences, and therefore by their different value proposals. Service providers (of accommodation, food, transportation, etc.), together with tourist attractions, are an essential element in value co-creation. The value proposal and the tourism experience will therefore be different in a sun and sand destination from those of an urban or a rural destination, which justifies the use of tourism destination type as a moderating variable in our explanatory model of MCE (Moliner *et al.*, 2023).

3. Methodology

3.1 Sample selection and data collection

An electronic version of the questionnaire was prepared. The research was approved by the university’s Ethics Committee (case number CD/109/2021). The questionnaire was distributed

Figure 1 Model of effects



Source: Authors’ own work

through the social media platforms Facebook and Instagram between November 2020 and March 2021. An advertisement was placed on both social media platforms rewarding participation with the opportunity to win a gift, thereby lending randomness to the sample selection. 1,476 valid responses were obtained. Responses covered three tourist destination types and up to seven different Spanish tourism destinations: 400 (27.2%) sun and sand (Peñíscola, Benidorm), 436 (29.5%), urban (Barcelona, Valencia) and 640 (43.4%) rural (Morella, La Rioja, Asturias). Participation was conditional on respondents having recently stayed at any of the chosen destinations. From an analysis of the primary data, we obtained the main characteristics of the sample for the tourist profile (Table 1).

3.2 Measurement instruments and control variables

All the scales used correspond to their theoretical definitions. The questionnaire items were scored on a five-point Likert scale, where 1 represents totally disagree and 5 represents totally agree. Table 2 summarizes the sources of the measurement scales used in the study. The scales for the four destination service experience dimensions were adapted from Klaus and Maklan's (2012) proposal to measure service experience. The scales used to evaluate the five local food experience dimensions were adapted from the local food motivation scale developed by Kim and Eves (2012). This adaptation took into account the elements of memorable food, drink and culinary tourism experiences identified by Stone et al. (2018). The scale to measure tourists' accommodation experiences was adapted from Nunkoo et al.'s (2017) proposal, with an item on environmental sustainability added to the existing ten aspects considered in this scale. Finally, Kim's (2018) proposal was used to assess memorable tourist experiences.

In addition, testing the model should consider biases from exogenous variables that may alter the causal relationships between the independent variable and the dependent variables (Nielsen and Raswant, 2018). We regarded age and gender as control variables in this study, following a common trend in tourism research (Papastathopoulos et al., 2020; Zheng et al., 2022; Krey et al., 2023).

3.3 Validity and scale reliability

We performed CFA using SEM to refine the scales; the EQS multivariate software package (version 6.2) was used. We adopted the maximum likelihood approach to estimate the parameters.

The least relevant indicators were eliminated following the scale refinement process, based on the structures of the latent variables assumed for each construct (Steenkamp and Van Trijp, 1991; Hair et al., 2010; Estrada et al., 2020). Indicators

Table 2 Scales used

Variables	References	Items
<i>Destination service experience</i>	Klaus and Maklan (2012)	19
Peace of mind		6
Moments of truth		5
Output focus		4
Product experience		4
<i>Local food experience</i>	Kim and Eves (2012)	20
Cultural experience	Stone et al. (2018)	4
Excitement		4
Interpersonal relationship		4
Sensory appeal		4
Concern for health		4
<i>Accommodation experience</i>	Nunkoo et al (2017)	11
<i>Memorable customer experience</i>	Kim (2018)	5

Source: Authors' own work

that did not meet the strong convergence condition were removed; that is, all indicators with individual standardized coefficients (λ) below 0.6 and an average standardized factor loading below 0.7. We verified compliance with the weak convergence condition by analyzing the significance of the factor regression coefficients between indicators and their latent variables; to this end, we considered the student t -value by imposing the maximum condition ($t > 2.58$; $p = 0.01$). This process led us to remove six indicators: EXP1.3, EXP3.3, EXP4.4, ACO.3, ACO.4 and ACO.8. This elimination does not alter the essence of the service experience dimensions because at most one item of the three dimensions has been eliminated, leaving three more items that capture the essence of the dimensions. Regarding the accommodation experience, it is on a very broad scale and the elimination of three items reduces the number of details considered. However, the remaining nine items reflect the fundamental elements of this variable. Finally, as each indicator was eliminated, we monitored the evolution of the main model fit measurements.

We performed several verification tests to check whether these refinement tests had a negative effect on scale reliability (Table 3). The tests used to verify internal consistency were Cronbach's alpha ($\alpha > 0.7$), construct composite reliability ($CR > 0.7$) and analysis of variance extracted ($AVE > 0.5$) (Churchill, 1979; Nunnally, 1979; Fornell and Larcker, 1981).

We tested convergent validity by returning to the CFA performed at the start of the process and by confirming the high

Table 1 Tourist classification data

Gender	Men				Women	
	36.3%				63.7%	
Age (mean: 37)	18–29	30–39	40–49	50–59	60–69	70 or more
	36.3%	22.0%	20.5%	13.1%	6.7%	8.1%
Occupation	Employee	Retired		Homemaker	Unemployed	Students
	64.1%	6.1%		4.1%	6.2%	19.5%
Studies	Primary educ.		Secondary educ.		High school	University educ.
	2.9%		7.3%		34.2%	55.6%

Source: Authors' own work

Table 3 Summary of the results after factor, reliability and validity analyses

Items	Factor loads	t-value
<i>Destination service experience (CR = 0.97; AVE = 0.88)</i>		
<i>Peace of mind ($\alpha = 0.867$; CR = 0.87; AVE = 0.57)</i>	0.933	27.580*
EXP1.1: In planning, booking and during the stay, everyone showed they knew what they were doing	0.685	Fixed
EXP1.2: In planning, booking and during the stay, the procedures were easy to carry out	0.685	24.340*
EXP1.3: Everything has been so easy at this destination that I wouldn't mind going back		Deleted
EXP1.4: In planning, booking and during the stay, everyone cared about me	0.800	28.040*
EXP1.5: In planning, booking and during the stay I felt that everything flowed easily	0.843	29.363*
EXP1.6: All the advice I received while planning, booking and during the stay was objective and independent	0.749	26.423*
<i>Moments of truth ($\alpha = 0.875$; CR = 0.88; AVE = 0.59)</i>		
EXP2.1: Everyone at this destination was flexible in dealing with me and cared about my needs	0.791	Fixed
EXP2.2: While planning, booking and during the stay, they kept me constantly informed	0.790	33.961*
EXP2.3: While booking and during the stay, I was sure that my money was well spent	0.797	34.311*
EXP2.4: There were good people at this destination: they listened to me, they were polite and they made me feel comfortable	0.739	31.132*
EXP2.5: When something went wrong during the booking and the stay, they solved it properly	0.712	29.720*
<i>Output focus ($\alpha = 0.833$; CR = 0.84; AVE = 0.63)</i>		
EXP3.1: During the booking and the stay, they made things very easy for me. I will consider them again in the future	0.831	Fixed
EXP3.2: The processes associated with the booking and the stay turned out to be as smooth as I had expected	0.789	36.052*
EXP3.3: I felt more confident about this destination than other destinations I had visited previously		Deleted
EXP3.4: The people at this destination were empathetic and understood my concerns	0.765	34.441*
<i>Product experience ($\alpha = 0.782$; CR = 0.79; AVE = 0.56)</i>		
EXP4.1: The offer available at this destination was wide and varied (leisure, gastronomy, accommodation, culture, etc.)	0.793	Fixed
EXP4.2: It was important for me to receive information about the different options that the destination offered	0.790	29.669*
EXP4.3: It was important for me to compare the different options to make the best decisions	0.648	24.215*
EXP4.4: I felt that I could count on someone to help me if I needed it		Deleted
<i>Local food experience (CR = 0.97; AVE = 0.88)</i>		
<i>Cultural experience ($\alpha = 0.913$; CR = 0.91; AVE = 0.73)</i>	0.927	35.431*
FOO1.1: Tasting the local food introduced me to the flavors of this region	0.830	Fixed
FOO1.2: I discovered something new through the local food	0.834	38.962*
FOO1.3: Experiencing the local food helped me understand the culture of this destination	0.860	40.889*
FOO1.4: Tasting local food in its place of origin was a special and authentic experience	0.881	42.539*
<i>Excitement ($\alpha = 0.912$; CR = 0.91; AVE = 0.72)</i>		
FOO2.1: Eating the local food in its place of origin was an exciting experience	0.835	Fixed
FOO2.2: Eating the local food during the trip helped me relax	0.847	40.360*
FOO2.3: Eating the local food put me in a good mood	0.868	42.024*
FOO2.4: Eating the local food during the trip allowed me to escape the routine	0.854	40.871*
<i>Interpersonal relationship ($\alpha = 0.854$; CR = 0.86; AVE = 0.61)</i>		
FOO3.1: I have talked to other people about my experience with the local food	0.753	Fixed
FOO3.2: During meals at the destination, the atmosphere was relaxed	0.830	29.287*
FOO3.3: I would like to give advice to people who want to travel to this destination based on my experiences with the local food	0.733	33.781*
FOO3.4: Eating the local food allowed me to spend pleasant moments with my companions	0.798	32.260*
<i>Sensory appeal ($\alpha = 0.888$; CR = 0.91; AVE = 0.71)</i>		
FOO4.1: The local food smelled good	0.887	Fixed
FOO4.2: The local food tasted good	0.894	49.810*
FOO4.3: The local food was well presented	0.858	45.792*
FOO4.4: Trying the local food gave me different sensations	0.717	33.361*
<i>Concern for health ($\alpha = 0.872$; CR = 0.87; AVE = 0.63)</i>		
FOO5.1: The local food was nutritious	0.830	Fixed
FOO5.2: The local food contained many fresh, local ingredients	0.844	38.596*

(continued)

Table 3

Items	Factor loads	t-value
FO05.3: The local food was healthy	0.797	35.497*
FO05.4: The restaurants were environmentally friendly	0.705	29.986*
<i>Accommodation experience</i> ($\alpha = 0.907$; $CR = 0.91$; $AVE = 0.56$)		
ACO.1: The style, design and cleanliness of the accommodation were to my liking	0.695	29.754*
ACO.2: The room was comfortable	0.731	31.899*
ACO.3: There were no problems at the check-in or the check-out		Deleted
ACO.4: The food and beverages in this accommodation had variety and quality		Deleted
ACO.5: The accommodation had adequate security features.	0.735	32.131*
ACO.6: The attitudes and behaviors of the employees demonstrated their willingness to help me	0.797	36.102*
ACO.7: The employees were competent and had professional knowledge	0.836	38.837*
ACO.8: My interaction with the other customers had a positive impact on this accommodation's service		Deleted
ACO.9: This accommodation provided me with opportunities for nice social interactions	0.795	35.941*
ACO.10: The waiting time for service was reasonable at this accommodation	0.689	29.427*
ACO.11: In this accommodation, the environment was cared for	0.681	28.981*
<i>Memorable customer experience</i> ($\alpha = 0.853$; $CR = 0.86$; $AVE = 0.55$)		
MEM.1: I really enjoyed that tourism experience	0.724	30.794*
MEM.2: I was revitalized through that tourism experience	0.762	33.077*
MEM.3: I learned something about myself from that tourism experience	0.685	28.584*
MEM.4: I had a chance to closely experience the local culture of that destination area	0.756	32.716*
MEM.5: I experienced something new (e.g. food, activity, etc.) during this tourism experience	0.766	33.317*

Fit of the model: $\chi^2/df = 2,440.949/1,052 = 2.320$; $NFI = 0.933$; $NNFI = 0.956$; $IFI = 0.961$; $CFI = 0.961$; $RMR = 0.032$; $RMSEA = 0.030$

Notes: IR = individual reliability; CR = composite reliability; AVE = average variance extracted; * $p < 0.001$

Source: Authors' own work

estimated value and significance of the correlations between the dimensions in the scales. Table 4 shows the discriminant validity of the constructs considered as assessed by AVE (Fornell and Larcker, 1981) and by confident interval tests (Anderson and Gerbing, 1988). Regarding the first of these tests, discriminant validity is confirmed when the square root of the AVE between each pair of factors is higher than the estimated correlation between them; this was the case in our study. The purpose of the confidence interval test is to verify that the value of 1 is not present within the confidence interval calculated for each pair of latent factors, taking into account the covariance of ± 2 standard errors around the estimated value yielded by the final CFA. Once again, the results confirm the discriminant validity of our model.

3.4 Complementary data analysis

Several other tests were also performed. First, the variance inflation factor among the latent variables in our proposed

model revealed no signs of multicollinearity. The results showed values between 1.677 and 4.793 (well below the threshold of 10), suggesting multicollinearity was not a concern in this study (Diamantopoulos and Siguaw, 2006; Kock, 2015). Second, we performed a *t*-test of independent means on the dimensions of the model variables using the first 50 and last 50 respondents (Armstrong and Overton, 1977). No significant differences were found between these respondents at the 0.05 level, thus confirming the absence of non-response bias. Third, we assessed the possibility of common method variance bias using Harman's test (Harman, 1976); this test assumes that, if this bias exists, in a factor analysis, a single factor should accumulate most of the covariance of independent and dependent variables. We performed a factorial analysis on the indicators yielded by the process using principal component analysis, in which we examined the unrotated factor solution (Podsakoff et al., 2003; Friedrich et al., 2009; MacKenzie and Podsakoff, 2012). The results of the factorial analysis showed that several factors had eigenvalues greater than 1. These

Table 4 Scale discriminant validity

Variables	1	2	3	4
1 Destination service experience	0.94			
2 Food experience	0.53* [0.49;0.57]	0.94		
3 Accommodation experience	0.76* [0.77;0.82]	0.57* [0.53;0.61]	0.76	
4 Memorable customer experience	0.65* [0.62;0.69]	0.73* [0.72;0.77]	0.67* [0.64;0.71]	0.74

Notes: Below the diagonal: correlation estimated between the factors. Diagonal = square root of AVE; * $p < 0.05$

Source: Authors' own work

factors explain 77.322% of the variance among the 49 items, with the first of the factors accumulating 33.141%. Hence, because several factors are identified and most of the variance is not accumulated by the first factor, a substantial part of the common method variance bias seems to be absent.

4. Analysis

Table 5 displays the covariance matrix resulting from the scale refinement process described in the previous section.

Based on this data, the hypotheses are tested using structural equation models to explore a series of dependence relationships simultaneously (Hair *et al.*, 2010). Figure 2 presents the step diagram of the resulting relationship model after its specification and identification.

In the next step, the hypotheses are tested with the module Lavaan de R. The results (Figure 3) show that accommodation experience and local food experience have a positive influence on MCE, both directly and indirectly, through their effect on the destination service experience. The direct influence of local food experience emerges as a major determining factor of MCE ($H4$: $\lambda = 0.533$, $t = 18.474^{**}$) when compared with the antecedent effect of accommodation experience, which is lower ($H5$: $\lambda = 0.208$, $t = 4.934^{**}$). Turning to the indirect influence, however, the effect of accommodation experience on destination service experience has a greater weight ($H3$: $\lambda = 0.781$, $t = 23.565^{**}$) than that associated with local food experience ($H2$: $\lambda = 0.074$, $t = 2.722^*$). These indirect influences are a result of the positive effect of destination experience on MCE ($H1$: $\lambda = 0.222$, $t = 5.377^{**}$).

Moreover, when the total effects derived from the proposed effects model were considered, these results were reinforced, highlighting the direct and indirect antecedent roles of accommodation experience and local food experience on MCE (Table 6). Table 6 also displays the effect of the control variables. Age has a positive effect on destination service experience, showing that the older the person, the greater the perception of destination service experience. Gender has no influence on the results of the model.

4.1 Multigroup analysis

Multigroup analysis is applied to examine the moderating effect of destination type; this analysis is appropriate when the moderating variable is categorical (MacCallum *et al.*, 2002). Seven tourism destinations corresponding to three typologies were selected: sun and sand, urban and rural.

The multigroup analysis first estimated three models (Table 7):

- 1 Model 1 (configurational model): the same model is imposed on the three groups;
- 2 Model 2 (weak invariance): the same model, but with factor loadings constrained to be equal across groups; and
- 3 Model 3 (strong invariance): the same model, but with intercepts and regressions constrained to be equal across groups.

All three models showed good fit indices. To uncover any between-group differences, we compared the Chi-squares of the configurational model (Model 1) with the Chi-square for the models in which the paths were constrained in the groups (Table 8). We ran two ANOVA tests: the first test compared Model 1 with Model 2, and the second compared Model 1 with

Model 3. The two p -values were significant, showing that this data set supports the configurational model (Model 1).

Therefore, the model with the best fit to the data is the one in which the paths were estimated separately and freely in the three groups; the regressions and the intercepts are not the same in the groups.

To identify the significant differences between the unconstrained model and the fully constrained model, we set partial constraints variable by variable and compared the three groups (Table 9). Significant differences were only detected in the relationship between local food and MCE, which showed a significantly lower value for the urban destination type than for the other two destination types ($p = 0.0457^*$). This result implies that there are no significant differences in the rest of the relationships proposed in the model.

The first aspect to note in the results of the multigroup analysis is the role of the control variables: the effect of age does not coincide with that identified in the initial mediator model, which showed that the older the tourist, the better their perception of the destination service experience. When the moderating variable (destination type) is included, age continues to bias the results, but its effect on destination service experience is no longer significant, whereas it does have a significant effect on MCE: the older the tourist, the lower their perception of MCE. In other words, the highest MCE values are generated by the youngest age groups, and this bias holds across all three destination types.

In addition, although the effects of the independent variables on the dependent variables hold (accommodation has a greater influence on destination service experience than local food, and local food has a greater influence on MCE than accommodation and destination service experience), we identified significant differences in the effects of local food on MCE. In urban destinations, the total effect is lower (0.497) than in sun and sand (0.563) and rural (0.564) destinations because of the greater importance the direct effect of local food has on MCE (urban: 0.486, rural: 0.552, sun and sand: 0.551).

All the proposed hypotheses are therefore corroborated. The study confirms accommodation as the main antecedent of the destination service experience, although local food also has a significant influence. In contrast, the main antecedent of MCE is local food, followed by accommodation and destination service experiences. Significant differences between destination types were revealed in the relationship between local food and MCE, with significantly lower values in urban destinations than in the other two. Age biases the results, as younger tourists generate more MCE.

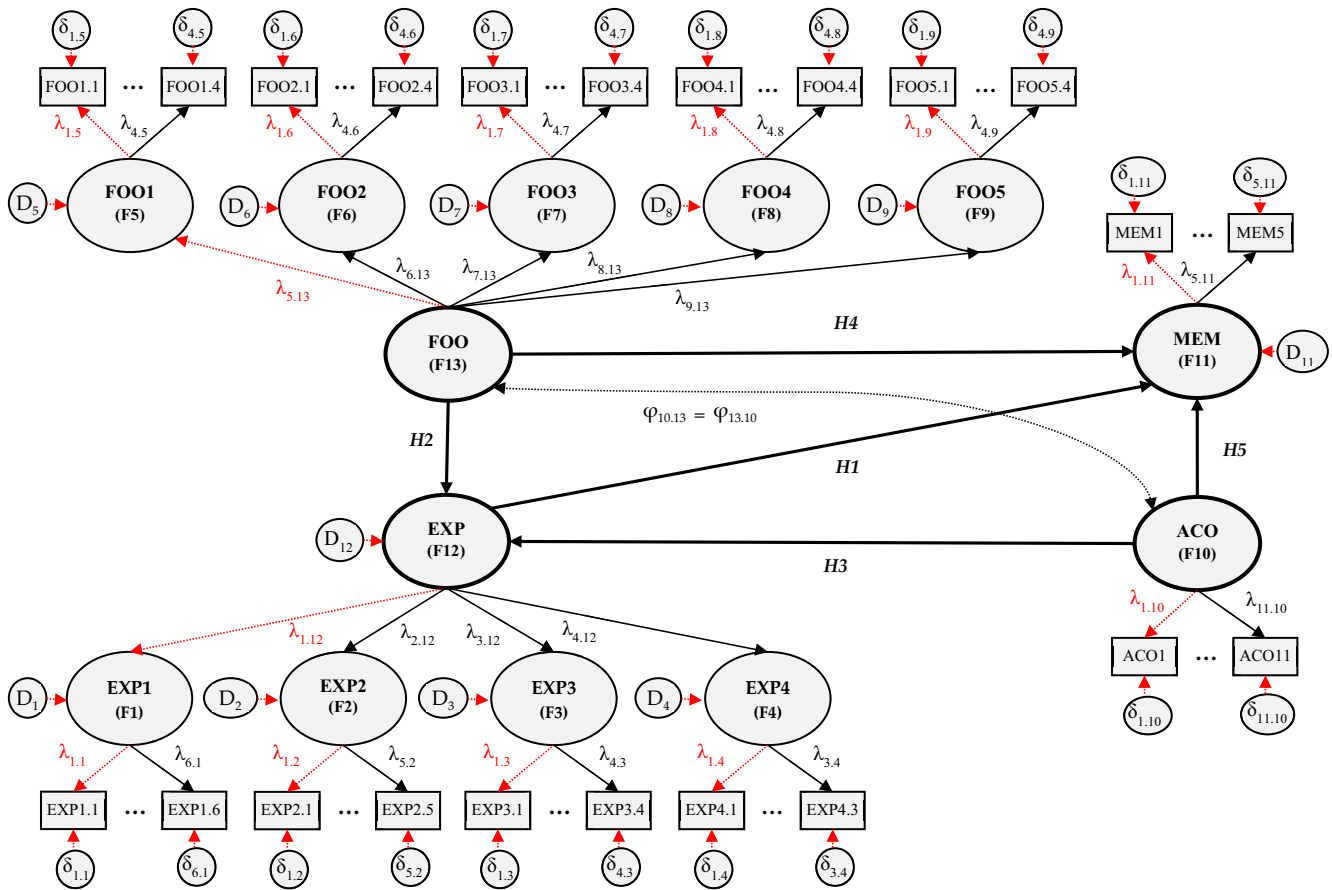
5. Discussion

This study analyzes the co-creation of customer experiences in a service ecosystem by examining the case of a tourist destination. The results of the empirical study conducted on tourist destinations show that the service ecosystem generates service experience and MCE at the aggregate level, along with the dyadic experiences generated by each actor in the network. The main antecedent of customer experience at the aggregate level is the ordinary experiences derived from dyadic customer-actor interactions, while MCE at the aggregate level is generated from

Table 5 (Continued)

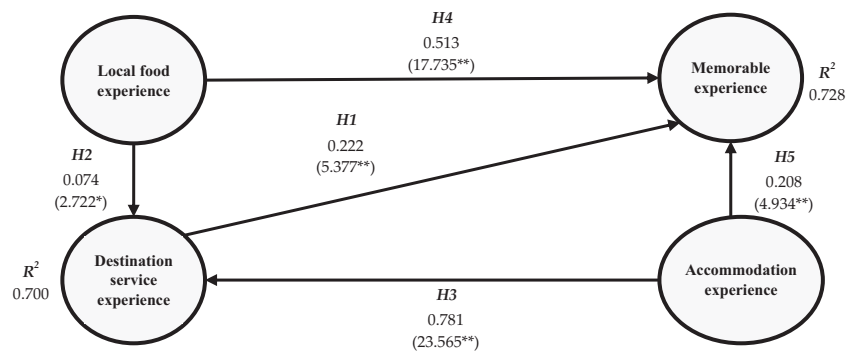
Variables	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	
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26	0.852																								
27	0.441	0.727																							
28	0.537	0.525	0.826																						
29	0.427	0.475	0.493	0.630																					
30	0.420	0.471	0.508	0.506	0.605																				
31	0.417	0.511	0.483	0.515	0.500	0.697																			
32	0.550	0.514	0.542	0.460	0.483	0.486	1.025																		
33	0.460	0.504	0.491	0.454	0.460	0.496	0.560	0.808																	
34	0.501	0.541	0.554	0.471	0.501	0.479	0.615	0.584	0.894																
35	0.404	0.511	0.445	0.413	0.408	0.479	0.506	0.582	0.590	0.882															
36	0.428	0.469	0.431	0.371	0.365	0.427	0.563	0.480	0.564	0.585	1.003														
37	0.284	0.370	0.305	0.287	0.288	0.338	0.298	0.303	0.348	0.334	0.331	0.866													
38	0.247	0.272	0.260	0.211	0.229	0.261	0.286	0.241	0.306	0.255	0.310	0.502	0.696												
39	0.255	0.309	0.237	0.226	0.210	0.279	0.316	0.307	0.316	0.340	0.387	0.480	0.430	0.877											
40	0.287	0.295	0.278	0.244	0.264	0.263	0.292	0.284	0.337	0.255	0.346	0.459	0.424	0.481	0.852										
41	0.286	0.272	0.259	0.232	0.236	0.259	0.297	0.286	0.297	0.276	0.344	0.431	0.409	0.501	0.608	0.743									
42	0.239	0.286	0.256	0.240	0.253	0.268	0.272	0.261	0.299	0.263	0.303	0.428	0.435	0.418	0.450	0.443	0.656								
43	0.261	0.283	0.259	0.236	0.220	0.265	0.286	0.270	0.282	0.278	0.349	0.373	0.336	0.482	0.462	0.477	0.417	0.877							
44	0.299	0.309	0.294	0.237	0.255	0.290	0.365	0.328	0.363	0.363	0.552	0.381	0.382	0.487	0.444	0.460	0.452	0.496	0.955						
45	0.248	0.298	0.266	0.245	0.256	0.280	0.274	0.254	0.276	0.234	0.242	0.321	0.280	0.267	0.282	0.278	0.308	0.262	0.269	0.497					
46	0.297	0.305	0.315	0.259	0.280	0.286	0.296	0.270	0.304	0.259	0.269	0.331	0.275	0.286	0.301	0.290	0.301	0.283	0.299	0.381	0.606				
47	0.307	0.300	0.291	0.265	0.262	0.288	0.427	0.321	0.328	0.318	0.386	0.232	0.220	0.308	0.260	0.302	0.245	0.314	0.366	0.308	0.369	0.959			
48	0.392	0.398	0.378	0.340	0.343	0.378	0.498	0.425	0.436	0.427	0.443	0.282	0.259	0.343	0.285	0.314	0.267	0.351	0.389	0.313	0.394	0.598	0.971		
49	0.372	0.374	0.359	0.323	0.358	0.341	0.463	0.356	0.391	0.317	0.370	0.263	0.266	0.270	0.284	0.272	0.283	0.285	0.322	0.310	0.383	0.486	0.561	0.788	

Figure 2 Structural equation model diagram



Source: Authors' own work

Figure 3 Results of the structural model



Fit of the model: $\chi^2/df = 4359.604/1200 = 3.633$; NNFI = 0.998; IFI = 0.998; CFI = 0.998; RMR = 0.039; RMSEA = 0.043

Notes: * $p < 0.01$; ** $p < 0.001$

Source: Authors' own work

the extraordinary experiences generated by service providers that surprise customers. The type of destination moderates the relationship between the variables, although it does not modify the relevance of the antecedents.

5.1 Findings

Regarding *RQ1* (How does the co-creation of experiences at the customer–actor dyadic level influence the generation of customer experiences at the ecosystem aggregate level?), the results show

Table 6 Total and indirect effects derived from the results of the structural model

Path	Direct effects		Total effects
	Load	t-value	Load
Food experience → Destination service experience	0.074	2.722*	0.074
Food experience → MTE	0.533	18.474**	0.549
Accommodation experience → Destination service experience	0.781	23.565**	0.781
Accommodation experience → MTE	0.208	4.934**	0.381
Destination service experience → MTE	0.222	5.377**	0.222
Control variables			
Age → Destination service experience	0.102	3.529**	
Gender → Destination service experience	-0.035	-1.215	
Age → MTE	-0.028	-1.060	
Gender → MTE	-0.010	-0.388	

Note: * = significance $p < 0.001$
Source: Authors' own work

Table 7 Free model vs constrained models in multigroup analysis

Models	Chi square	df	p-value	RMR	RMSA	CFI
Model 1	8,490.802	3,579	0.000	0.056	0.054	0.900
Model 2	8,695.929	3,669	0.000	0.063	0.054	0.898
Model 3	10,097.227	3,651	0.000	0.059	0.060	0.874

Source: Authors' own work

that the aggregate evaluation at the ecosystem level depends on the dyadic evaluations at the actor level (Le *et al.*, 2023; Barrios *et al.*, 2023). Moreover, the ordinary or extraordinary nature of customer-actor dyadic experiences is what determines the generation of service experience and MCE at the ecosystem level. All the customer's dyadic interactions in the network can generate ordinary and extraordinary experiences, but the latter have more capacity to impact MCE at the aggregate level (Moliner *et al.*, 2023; Lee, 2023). In contrast, ordinary dyadic experiences are the main generators of the service ecosystem experience at the aggregate level.

As for RQ2 (What is the relationship between service experience and MCE at the ecosystem aggregate level?), the results show that service experience is a necessary condition for producing the MCE for a service ecosystem, but it is not sufficient on its own. In fact, services provided by network actors that offer novelty, authenticity, differentiation and exceptionality are the main antecedent of MCE, not the service experience at the aggregate level (Prentice *et al.*, 2022; Roggeveen and Rosengren, 2022).

Finally, with regard to RQ3 (What moderating role does the type of service ecosystem play in generating customer experiences?), the results show that the type of ecosystem moderates the relationships between the variables, although it

does not modify the relative importance of the drivers (Moliner *et al.*, 2023). This finding reinforces the generalization of the results of this study. However, when studying service ecosystems, it is important to take the type of ecosystem into account because each one combines a different set of products, services, activities and experiences to create, distribute and capture customer value (Osterwalder and Pigneur, 2010). The co-creation of value and experiences in each ecosystem has unique particularities because each has its own resources, institutional arrangements and actors. This finding opens an interesting line of research concerning the structural and behavioral aspects that favor value co-creation in service ecosystems. That mutualized value co-creation is a complex process, in which agents may pursue their own self-interest and in which actors may be decoupled from each other, should be taken into account (Mustak and Plé, 2020; Le *et al.*, 2023; Barrios *et al.*, 2023).

5.2 Managerial recommendations

Some practical recommendations arise from the study. First, it is vital to stimulate institutions in service ecosystems in general and in tourism destinations in particular. According to S-D logic, a tourist destination is a service ecosystem that must be supported by a governance structure and regulations and practices that enable public-private collaboration (Le *et al.*, 2023). An ecosystem governance entity, such as a destination management organization (DMO), is a key element for establishing the ecosystem's strategy and for coordinating all the service providers involved in co-creation. An ecosystem should establish an entity to coordinate service providers that can enhance the customer experience and design a value proposal that generates MCE.

Secondly, extraordinary experiences should be promoted in service ecosystems. If a service ecosystem is to generate memorable

Table 8 ANOVA multigroup analysis

Models	df	AIC	BIC	Chi sq.	Chi sq. diff	df diff	Pr (>Chi sq.)
Model 1	3,561	153,008	155,945	9,702.1			
Model 2	3,651	153,223	155,684	10,097.2	395.11	90	<2.2e-16**
Model 3	3,669	155,191	157,553	10,328.9	231.69	18	<2.2e-16**

Notes: Signif. codes: 0 "****"; 0.001 "***"; 0.01 "**"; 0.05 "."; 0.1 " " 1

Source: Authors' own work

Table 9 Summary results of the structural model: multigroup analysis

Hypotheses	Path	Parameter	t-sig	Result
Urban destination				
H1	Destination service experience → MCE	0.155	3.820**	Supported
H2	Local food experience → Destination service experience	0.071	3.245*	Supported
H3	Accommodation experience → Destination service experience	0.733	17.588**	Supported
H4	Local food experience → MCE	0.486	12.997**	Supported
H5	Accommodation experience → MCE	0.265	6.050**	Supported
<i>Control variables</i>				
	Age → Destination service experience	0.019	1.110	Not supported
	Gender → Destination service experience	-0.027	-1.663	Not supported
	Age → MCE	-0.076	-3.896**	Supported
	Gender → MCE	-0.011	-0.611	Not supported
Total effect: Local food experience → Memorable customer experience = 0.497				
Total effect: Accommodation experience → Memorable customer experience = 0.379				
Rural destination				
H1	Destination service experience → MCE	0.157	3.820**	Supported
H2	Local food experience → Destination service experience	0.079	3.245*	Supported
H3	Accommodation experience → Destination service experience	0.756	17.588**	Supported
H4	Local food experience → MCE	0.552	12.997**	Supported
H5	Accommodation experience → MCE	0.277	6.050**	Supported
<i>Control variables</i>				
	Age → Destination service experience	0.024	1.110	Not supported
	Gender → Destination service experience	-0.034	-1.663	Not supported
	Age → MCE	-0.096	-3.896**	Supported
	Gender → MCE	-0.014	-0.611	Not supported
Total effect: Local food experience → Memorable customer experience = 0.564				
Total effect: Accommodation experience → Memorable customer experience = 0.396				
Sun and beach destination				
H1	Destination service experience → MCE	0.138	3.820**	Supported
H2	Local food Experience → Destination service experience	0.090	3.245*	Supported
H3	Accommodation experience → Destination service experience	0.749	17.588**	Supported
H4	Local food experience → MCE	0.551	12.997**	Supported
H5	Accommodation experience → MCE	0.242	6.050**	Supported
<i>Control variables</i>				
	Age → Destination service experience	0.021	1.110	Not supported
	Gender → Destination service experience	-0.030	-1.663	Not supported
	Age → MCE	-0.075	-3.896**	Supported
	Gender → MCE	-0.011	-0.611	Not supported
Total effect: Local food experience → Memorable customer experience = 0.563				
Total effect: Accommodation experience → Memorable customer experience = 0.345				
Fit of the model: $\chi^2/df = 8,490.802/3579 = 2.372$; NFI = 0.840; NNFI = 0.893; IFI = 0.901; CFI = 0.900; RMR = 0.056; RMSEA = 0.054				
Note: * = significance $p < 0.001$				
Source: Authors' own work				

experiences, it must look for novelty, authenticity, differentiation and exceptionality, which are the ideal characteristics for generating a memory with a rich phenomenology in the brain (Stone *et al.*, 2017; Lee, 2023). For MCE to flourish, there must be novel, multisensory and hedonic aspects that generate affective emotions and connect with the consumer's ambitions, beliefs, values and/or feelings (Prentice *et al.*, 2022; Roggeveen and Rosengren, 2022). Local food should be promoted in tourist destinations because of its importance in generating MCE. The restaurants in a tourist destination, of whatever type, should aim to offer local products whenever possible. Local food should form part of the destination's gastronomic story and should be promoted in efforts to capture

tourists because it is one of the attractions most highly valued by potential visitors. It should also be highlighted in the on-site experience, on menus, above other gastronomy-related aspects. Local food not only enhances MCE but also, as shown in other studies (Moliner *et al.*, 2023), positively influences the visitor's perception of the destination's sustainability. We believe that promoting local food offers mature tourist destinations with an established image an appropriate strategy with which to differentiate themselves from their competitors.

Finally, service ecosystems should keep in mind that age biases MCE. An experience that proves memorable for a young visitor may not have the same effect on an older visitor. In tourism,

beyond the reasons motivating the trip, age conditions the memorability of the experience. Young tourists are more likely to generate MCE, and as they grow older, their capacity for surprise declines. There are currently five different generations, each with quite different values and behaviors. Segmenting and personalizing offers and experiences is a key factor in generating MCE.

5.3 Limitations and future research

The study has some limitations that limit the generalizability of our conclusions. The data are cross-cutting and therefore refer to a specific moment in time. It would be convenient to use a time series to follow its evolution over time. The sample was taken from a single country, but multinational and multicultural samples would be interesting. The data-gathering process was conditioned by the pandemic and the need to maintain social distance, which made it impossible to administer the survey in person. However, we think our study opens up some interesting new research lines.

Like any service ecosystem, a tourist destination is made up of different service providers offering accommodation, transportation, food, tourist attractions, public services, leisure, nightlife and so on. The service ecosystem perspective highlights the importance of analyzing all these services together, because they all contribute to customer experiences. More research is therefore needed to study their combined effect on service experience and MCE.

Although tourists remember their visit to a destination through MCE, it would be useful to explore the service experience and MCE of each type of service provider. The literature reflects interest in this topic in some sectors of the hospitality industry (accommodation and food), but there are other service providers, products, services, activities and experiences along the tourism value chain that also have the potential to generate MCE. To take this research line forward, specific MCE measurement scales will be required for each type of service provider.

A third aspect of future research is the role of institutions. The service ecosystem paradigm highlights the importance of the set of rules, regulations, practices and values that enable collaboration among service providers. Coordination between the links in an ecosystem's value chain appears to be crucial to offering a good service experience and generating MCE. The role of an ecosystem governance entity seems to be key, but the existence of this entity does not guarantee that the ecosystem will function well. Interdependence theory can help establish a theoretical framework for governance structures and behavioral regulations that favor ecosystem outcomes.

Finally, age emerged as an important exogenous variable in generating MCE. Despite the clarity of our statistical results, further work is needed to explore why age influences MCE. For example, identifying the elements in a destination with the greatest influence on MCE for each generation is a highly interesting question for DMOs.

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