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The concept of sustainability as perceived by tourists has rarely been studied and much less considered as a basis for segmentation. This article provides a conceptual framework based on tourists' perception of sustainability policies at destinations and a multidimensional measure for this construct. An empirical analysis at five Mediterranean destinations validated the conceptual proposal and provided empirical evidence for the potential use of perceived sustainability in segmentation studies. Our findings show the discriminating power of the construct, identifying four latent clusters. Perceived sustainability as a tool for segmentation can help analyze the effectiveness of sustainability strategies and action taken.

Keywords: perceived sustainability; conceptual framework; multidimensionality; tourist; destination; segmentation; sustainability strategies; latent class analysis; Latent Gold; Mediterranean Region

Introduction

Considerable attention has been given to segmentation strategies in the tourism industry, because they help understand tourist behavior and improve competitiveness (Hennessey, Yun, & McDonald, 2012). This study contributes to that research by analyzing the concept of perceived sustainability, understood as the tourist's perception of sustainability policies implemented at destinations, and its suitability as a basis for segmentation. Authors such as Chen, Liu and Chang (2013), Landauer, Pröbstl and Haider (2012), Nickerson, Jorgenson and Boley (2016), and Rondan-Cataluña and Rosa-Diaz (2012) have identified tourist groups or segments with similar reactions according to segmentation criteria, such as sociodemographic characteristics, psychographic and behavioral variables, price and value, customer service factors, etc. However, segmentation studies have given very little attention to tourists' perception of sustainability. In general, few studies have focused on the analysis of perceived

sustainability (Cottrell, Vaske, & Roemer, 2013; Iniesta-Bonillo, Sánchez-Fernández, & Jiménez-Castillo, 2016; Kim, Taylor, Kim, & Lee, 2015; Lee, 2013; Mathew & Sreejesh, 2017), even though it is fundamental to the success of sustainability strategies (Kim et al., 2015). Thus, tourist perceptions are key elements in analyzing the effectiveness of these strategies at destinations. Despite its importance, there is a lack of conceptual delimitation of the notion "perceived sustainability". Only the study by Sánchez-Fernández, Iniesta-Bonillo and Cervera-Taulet (2016) analyzed tourists' perceived sustainability in market segmentation, and they focused exclusively on the environmental dimension.

Furthermore, for perceived sustainability to be used as a basis for tourist segmentation, specific statistical techniques for determining unobserved heterogeneity must be applied. Observed heterogeneity of tourists can be detected by a priori known variables (e.g., demographic and socio-economic variables such as gender, age or income). However, unobserved heterogeneity can only be inferred from the data, because the subpopulation an individual belongs to is not known a priori (Wedel & Kamakura, 2000). Tourist perceived sustainability is one of such factors that cannot be directly observed. Several studies have demonstrated the superior performance of latent class segmentation based on unobserved heterogeneity over traditional cluster-based techniques (Magidson & Vermunt, 2002; Rondan-Cataluña, Sanchez-Franco, & Villarejo-Ramos, 2010).

This study contributes to sustainability research in three specific ways. First, a conceptual framework is provided for the analysis of tourist perceived sustainability strategies at destinations. Second, a tourist perceived sustainability scale was developed by extrapolating the widely accepted multidimensionality of sustainability (Iniesta-Bonillo et al., 2016; Kožić & Mikulić, 2014; Martínez, Pérez, & Rodríguez del Bosque,

2013; Mathew & Sreejesh, 2017), consisting of environmental, sociocultural and economic sustainability, to the concept of sustainability perceived by tourists. Finally, we provide empirical evidence for the potential use of the variable "perceived sustainability", that is, tourists' evaluation of destinations in terms of their perceived sustainability, in segmentation studies. Using new statistical advances based on latent class segmentation, we were able to capture unobserved heterogeneity in tourist responses for that purpose. Our findings can be helpful to researchers and managers in the tourism industry for improving their knowledge of tourist perceptions of the sustainability of destinations. This information would enable tourism businesses and local government to better define and measure the tourist's perception of sustainable initiatives when visiting destinations, and to develop their strategies accordingly.

The article is structured as follows. First, it reviews the literature on segmentation in the tourism industry. We then provide a conceptual framework for sustainability strategies at destinations based on the concept of tourist perceived sustainability. We outline the methodology used in the study, and present the data analysis and results. Finally, we conclude with a discussion of the study, implications, limitations and future lines of research.

Literature review

Segmentation in the tourism industry

The importance of segmentation strategies has been widely acknowledged by tourism research (Dolnicar, Grün, Leisch, & Schmidt, 2014; Landauer et al., 2012; Nickerson et al., 2016). However, despite the large number of studies in segmentation and tourism, gaps in research on sustainability and market segmentation remain. In particular, the use

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of tourist perceived sustainability of a destination has never been addressed as a basis for segmentation, except for a study by Sánchez-Fernández et al. (2016). The review of the literature shows that customer segmentation criteria in tourism services appear to rely on both general and product-specific bases. Some studies have shown that the tourist's personal characteristics, such as motivation (Chiang, Wang, Lee, & Chen, 2015; Dey & Sarma, 2010), emotions (Bigné & Andreu, 2004; Del Chiappa, Andreu, & Gallarza, 2014), or the need for variety (Barroso-Castro, Martín-Armario, & Martín-Ruiz, 2007), are valuable for segmenting markets. Other authors have identified segments based on experience with the services offered, the journey or the destination, for instance, service quality (Murphy, Schegg, & Olaru, 2007), price and value for money (Rondan-Cataluña & Rosa-Diaz, 2012), destination characteristics and activities (e.g., Hennessey et al., 2012; Landauer et al., 2012), website (Díaz & Koutra, 2013), customer services (Chen et al., 2013), or tourist satisfaction (Ramírez-Hurtado & Berbel-Pineda, 2014). So far, several studies have focused on tourist perceptions (e.g., Liu, 2014; Rondan-Cataluña & Rosa-Diaz, 2012; Sánchez-Fernández et al., 2016; Seabra, Dolnicar, Abrantes, & Kastenholz, 2013), which are an unobservable and product-specific basis for segmentation, but few of them have analyzed such perceptions from the point of view of sustainability.

The literature review reveals that researchers have not delved into (1) definition or measurement of tourist perceived sustainability, nor (2) identification or profiling of tourist segments with different perceptions of sustainable strategies and initiatives implemented by destination managers and Destination Marketing Organizations (DMOs). This information is especially important for tourism businesses and local government, since they need to be able to evaluate the efficiency of their sustainability initiatives. In the field of sustainability, previous studies have mainly focused on

segmenting sustainable tourists (e.g., Kim & Weiler, 2013; López-Sánchez & Pulido-Fernández, 2016; Stanford, 2014). Some of them have focused on profiling environmentally-friendly tourists (e.g., Dolnicar, 2004; Dolnicar, 2010; Dolnicar, Crouch, & Long, 2008), analyzing differences in terms of environmentally responsible behavior (Lee, Jan, Tseng, & Lin, 2017), or comparing sustainable behavior with tourist spending to detect market segments especially attractive to business (e.g., Lundie, Dwyer, & Forsyth, 2007; Moeller, Dolnicar, & Leisch, 2011; Nickerson et al., 2016). However, none of them analyzed destination sustainability from a perceptual perspective, except Sánchez-Fernández et al. (2016), who only considered the environmental dimension of sustainability. As perceptions are subjective, selective and temporal, each tourist's interpretation and perception of a particular destination or sustainable action is different. Thus, it is particularly necessary for destinations to know more about those perceptions, seeking individual similarities and differences. As Hult (2011) states, "sustainability-driven organizations create unique idiosyncrasies that positively affect their standing in the marketplace, offer an opportunity for market segmentation, and deliver value to customers (and other stakeholders)" (p. 2). Therefore, sustainability strategies and marketing communications should be adapted to each market segment according to its perceptions of sustainability, in order to create positive expectations as part of the value proposition of destination managers. This would stimulate consumers to decide for those destinations. This market orientation is necessary even when sustainability is not a relevant attribute or fundamental motivation in choosing a destination. In any case, sustainability policies play a fundamental role in reinforcing or extending value propositions in the value co-creation process linking destination managers and tourists (Lacoste, 2016).

Conceptual delimitation of perceived sustainability

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As mentioned above, research on perceived sustainability, especially from the consumer's perspective (Catlin, Luchs, & Phipps, 2017), is still scarce (Kim et al., 2015). In particular, in the context of tourism, the limited and fragmented research analyzing perceived sustainability has not provided a clear definition or a conceptual framework for this notion. This lack of a theoretical foundation is widespread in other settings, where to the best of our knowledge, no definition of "perceived sustainability" has been proposed. In general, consumer perception refers to the process of selecting, organizing, and interpreting information and stimuli (Solomon, Bamossy, Askegaard, & Hogg, 2016) by cognitive-affective evaluative judgement, to create a meaningful picture of the product, service or brand. Adapting this global conceptualization to the context of sustainability in tourist destinations, we propose a definition of *perceived sustainability* as *the tourist's cognitive-affective evaluation of sustainability policies implemented at a particular destination by managers and destination marketing organizations*. In this study, we adopted a perceptual measure of sustainability to capture the diversity of tourist attitudes and perceptions about the sustainability of a given destination. In fact, perceived sustainability is a key concept differentiating consumers (Pulido-Fernández & López-Sánchez, 2014; Verain, Sijtema, & Antonides, 2016). Therefore, it is important to analyze the role of perceptions in the development of sustainability policies at destinations.

Despite the sustained efforts of research and the considerable importance of sustainability in business management in general and tourism in particular, its scattered and inconclusive definition has resulted in a variety of approaches and interpretations of the concept (Cernat & Gourdon, 2012; Higgins-Desbiolles, 2010; Iniesta-Bonillo et al., 2016). Consequently, there is still no agreement on a universal list of indicators enabling the comparison of sustainability levels in different contexts. For instance,

several studies have provided indicators and measures of sustainability for products (e.g., Kwon & Song, 2012; Verain et al., 2016), companies (e.g., Choi & Ng, 2011; Chow & Chen, 2012; Collins, Steg, & Koning, 2007; Hill & Lee, 2012; Martínez & Rodríguez del Bosque, 2014; Martínez et al., 2013), countries (e.g., Van de Kerk & Manuel, 2008) or public organizations (e.g., Roman, 2017). According to Van de Kerk and Manuel (2008), the main shortcomings in the measurement of this construct are "a limited definition of sustainability, a lack of transparency and an absence of regular updates" (p. 228).

In the particular context of tourism, the Global Sustainable Tourism Council (GSTC) has made one of the most outstanding contributions. This organization developed a set of baseline criteria for arriving at a common understanding of how sustainable tourism can be defined and operationalized. However, the Global Sustainable Tourism Criteria for Destinations (GSTC-D) has not been widely recognized or accepted in the academic literature on tourism (Bricker & Schultz, 2011; Buckley, 2012; Derkx & Glasbergen, 2014). Another fundamental basis for the definition and use of indicators of sustainability in tourism was proposed by the United Nations Environment Programme and World Tourism Organization (UNEP & WTO, 2005), based on the previous publication of a comprehensive guide of 29 baseline indicators of sustainable development for tourist destinations (UNWTO, 2004). A large number of studies have measured tourism sustainability using other procedures and scales (e.g., Blancas, González, Lozano-Oyola, & Perez, 2010; Castellani & Sala, 2010; Cernat & Gourdon, 2012; Farsari & Prastacos, 2001; Ko, 2005; Kožić & Mikulić, 2014; Nickerson et al., 2016). For example, Farsari and Prastacos (2001) and Blancas et al. (2010) provided lists of sustainable tourism indicators as a tool for assessing tourism development at destinations. Ko (2005) designed a tourism sustainability assessment

procedure based on two complementary devices (Barometer of Tourism Sustainability –
BTS; and AMOEBA of Tourism Sustainability Indicators – ATSI). Cernat and Gourdon
(2012) offered a methodological framework (called Sustainable Tourism Benchmarking
Tool – STBT) for assessing the sustainability of international tourism activities, and
Nickerson et al. (2016) analyzed sustainable tourist behavior using the 15 Geotraveler
Tendency Scale (GTS) indicators.

A review of the literature shows that few researchers have addressed the analysis
and measurement of perceived sustainability at destinations. For example, Cottrell et al.
(2013) analyzed resident satisfaction with sustainable tourism development using 22
items to measure four sustainability dimensions (environmental, economic,
sociocultural, and institutional), and Lee (2013) evaluated resident support for
sustainable tourism development with a perceived cost/benefit scale. Pulido-Fernández
and López-Sánchez (2014) identified a list of attributes of sustainable tourism based on
tourist perceptions. Iniesta-Bonillo et al. (2016) measured the concept of perceived
sustainability of the destination proposing a 10-items scale with three dimensions
(economic, cultural and environmental sustainability). In the same vein, Mathew and
Sreejesh (2017) developed a perceived destination sustainability scale consisting of 23
items and four dimensions (economic, social, cultural and environmental sustainability).

The increasing number of approaches to the measurement of sustainability in
tourism is also the result of a multitude of proposals on the nature and dimensionality of
the concept. Some authors use a list of items to measure this notion as a one-
dimensional construct (e.g., Pulido-Fernández & López-Sánchez, 2014). Others argue
the existence of multiple dimensions, although there is a lack of consensus on this
(Pérez, Guerrero, González, Pérez, & Caballero, 2013). Several authors have suggested
that sustainability is based on three dimensions: environmental, sociocultural and

economic (e.g., Farsari, 2012; Iniesta-Bonillo et al., 2016; Jamrozy, 2007; Kožić &

Mikulić, 2014; Martínez et al., 2013; Mathew & Sreejesh, 2017; Torres-Delgado &

López Palomeque, 2014). However, other researchers have proposed four dimensions,

adding institutional sustainability to the traditional "triple bottom line" (e.g., Cottrell et

al., 2013; Puhakka, Cottrell, & Siikamäki, 2014; Spangenberg, 2002), or defining

dimensions such as aesthetic, environmental, cultural heritage and wellbeing of the local

population, as suggested by Nickerson et al. (2016). Moreover, Agyeiwaah, McKercher

and Suntikul (2017) recently suggested the existence of four core dimensions of

sustainability (economic, social, environmental and cultural) and three peripheral

dimensions (political, management/institutional and technology). Following the most

widely accepted triple bottom line approach to sustainability (e.g., Farsari, 2012;

Iniesta-Bonillo et al., 2016; Kožić & Mikulić, 2014; Martínez et al., 2013; Mathew &

Sreejesh, 2017), in this study, we defined the concept based on three dimensions: (1)

Environmental. Sustainability literature originally focused mainly on this dimension

(Collins & Flynn, 2008). It is related to natural capital and renewable and nonrenewable

resources; (2) *Sociocultural.* This refers to the interaction between humans and the

environment, as well as protection of sociocultural resources. Although some authors

posit negative impacts of tourism (Mbaiwa, 2005), a large number of studies emphasize

that tourism provides employment opportunities, leads to wider acceptance of the local

culture and cross-cultural exchange with other countries (e.g., Chiang et al., 2015; Choi

& Sirakaya, 2005; Mathew & Sreejesh, 2017); (3) *Economic.* This dimension focuses

on the population's economic needs and improving their standard of living (Mbaiwa,

2005).

   According to the definition of perceived sustainability proposed, our conceptual

framework explains why sustainability strategies developed by destination managers

and DMOs should be market oriented, and how sustainability strategies are created (see Figure 1). Following Hult (2011), "market-focused sustainability can be a strategic resource… that leads to competitive advantage for the organization and, ultimately, to superior performance" (p. 2). A "strategically-based marketing view of sustainability" involves consumers (García-Ramos, 2007; Hult, 2011), and therefore, the cyclical process of creating sustainability must be focused on tourist perceptions. The starting point in this process is the tourist's evaluative judgment or **perception** of sustainability of the destination, considering the multidimensional nature of this notion (i.e., the tourist's evaluation of the environmental, sociocultural and economic dimensions of sustainability). In a second stage, destination managers and DMOs gather information and acquire knowledge about consumers' and other market participants' perception of sustainability (i.e., sustainability perceived by tourists, residents, intermediaries, etc.). This involves a continuous process of **evaluation and control** by undertaking market research, integrating this knowledge and sharing it throughout the organization. Based on this awareness and enhanced understanding of the market, the next stage is the design, development and **implementation** of sustainability strategies adapted to the market, providing a value proposition in terms of environmental, sociocultural and economic sustainability at tourist destinations. Ultimately, the creation of sustainability is a dynamic process with a clear market orientation, founded on value co-creation by organizations and consumers (Lacoste, 2016). Co-creation of value considering sustainability provides a potential source of competitive advantage for organizations and a fundamental basis for consumers to create value.
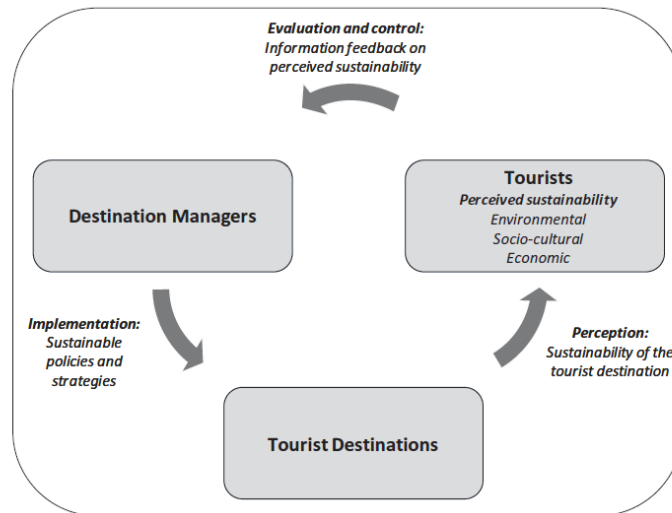
Figure 1. A conceptual framework for sustainability strategies at tourist destinations

Methodology

Methods and research context

A survey empirical study was carried out in view of the scarce literature in the field on segmentation by tourist perceived sustainability and our desire to analyze the Mediterranean destinations in the "NewCiMed" movement. The Mediterranean Region was chosen, first, because it is one of the tourist areas most visited in the world (UNWTO, 2017), and second, a multitude of sustainability policies have been implemented in this area. However, the rapid, unplanned development of tourism in the Mediterranean has also resulted in common shared sustainability problems (Farsari, 2012). Therefore, sustainability and strategies are of potential interest in this area.

Five Mediterranean cities, with 155 to 199 respondents in each, were chosen as the specific setting for our empirical study: Cullera (Spain), Latina (Italy), Maamoura (Tunisia), Tafilah (Jordan), and Tyre (Lebanon). The first two cities are northern Mediterranean, and the remaining three on the southern coast. These cities are part of the New Towns Movement, an urban phenomenon in the Mediterranean. They are

considered pilot areas by NewCiMed (New Cities in the Mediterranean Sea Basin), an ENPI CBC MED Programme standard project funded by the European Union, which started in 2007 (NewCiMed, 2017a). Among other goals, this project promotes cultural heritage, socioeconomic development and environmental management in the partner territories. They define a "new town" as "a city or community that was carefully planned from its inception and is typically constructed in a previously undeveloped area" (NewCiMed, 2017a).

Sample design and data collection

This exploratory research was conducted using a convenience sampling method to gather information from 918 tourists (455 males and 463 females). This sampling technique was chosen following previous studies on sustainability and market segmentation (e.g., Barr, Shaw, & Coles, 2011; Kim & Weiler, 2013), and because of its capacity for acquiring an appropriate sample size in a minimum time. According to Barr et al. (2011), the use of nonprobability samples in segmentation studies is relatively common, even though probability samples are more commonly used in social research. This method is also justified in our empirical study because the purpose was to generate empirical data for our research objectives: to develop a conceptual model and a measurement scale for the "perceived sustainability" concept and to provide empirical support for the potential use of perceived sustainability in market segmentation analyses, rather than providing or defining a new segmentation model for the Mediterranean tourist population. Therefore, visitor surveys were conducted at one of the main tourist sites at each destination where the probability of finding tourists was much higher than elsewhere at those destinations to acquire a suitable size sample of tourists.

Data were collected from June to August 2013 in self-report questionnaires given to tourists (see Table 1). The trained interviewers provided respondents with detailed information about the aim of the study. Following Roxas and Lindsay (2012), a three-step process for self-report questionnaires on sustainability topics was applied to reduce the risk of social desirability bias, which is a common significant limitation in most sustainability research (e.g., Kim & Weiler, 2013; Roman, 2017). First, the literature on relevant indicators and adapted existing measures was reviewed. Then the original questionnaire was pilot-tested to analyze the reliability and validity of the measurement scales. Second, during survey administration, potential response bias was reduced by triangulating temporal and spatial data sources using pretest information. Since researchers should consider the timing and circumstances of survey administration (Roxas & Lindsay, 2012), respondents in the qualitative part of the pretest provided information about the most appropriate time and place for data collection at the tourist destinations. According to this information, and to ensure adequate representation of the relevant population, respondents were selected at different times of day and on different days of the week, and at one of the main tourist sites at each destination. Finally, in the post-survey stage, survey responses were compared to the pretest using a descriptive analysis of frequency distributions and analysis of variance to examine the validity of the survey data.

The analysis of the demographic data showed sample homogeneity. Gender was similarly represented and the average age was around 38 at all destinations. Around 80% of the tourists surveyed indicated average or higher education. They mainly travelled for leisure (average 65% with the exception of Tunisia), and most spent less than 100 Euros per day (around 80% of respondents in all the cities surveyed). In

addition, fewer than four nights were spent at the destination by 54.6% of the

respondents and from four to six by 8.0%.

Table 1. Characteristics of the sample

Universe	Tourists at five cities in the Mediterranean Sea basin				
	Total northern Mediterranean n = 378		Total southern Mediterranean n = 540		
Sample	*Cullera (Spain)*	*Latina (Italy)*	*Maamoura (Tunisia)*	*Tafylah (Jordan)*	*Tyre (Lebanon)*
	187	191	199	155	186
Inhabitants (approximately)	24,000	120,000	7,000	40,000	120,000
Total sample	918 tourists				
Geographical scope	Mediterranean Sea basin				
Data collection method	Self-report questionnaire				
Sampling procedure	Non-probabilistic method: convenience sampling				

Questionnaire development

Churchill's (1979) procedure for developing measures of marketing constructs was

followed to develop the questionnaire. First, the construct domain was specified based

on the definition of perceived sustainability proposed and the conceptual framework

discussed above. Then, an extensive literature review was carried out to compile a list

of items that could be used or adapted to define the three dimensions of sustainability.

To ensure scale content validity, our measurement instrument was based on two

previous studies (Farsari, 2012; Mathew & Sreejesh, 2017) in which the conceptual

domain was related to our theoretical proposal. Thus, Farsari (2012) analyzed the

sustainability phenomenon at Mediterranean tourist destinations, and Mathew and

Sreejesh (2017) provided an updated empirical approach to the perceptual underpinning

of sustainability. Both studies were used as a basis for the environmental and

sociocultural sustainability scales, but development of the economic sustainability scale

was based only on Farsari's (2012) proposal. Then, four marketing professors

specialized in tourism research reviewed the original list to remove redundant or inconsistent items and add any others they considered appropriate. This resulted in a list of 15 items. Environmental sustainability (ENS) was measured by seven items that reflect the effective conservation of natural resources and minimization of negative impacts of tourism (pollution, noise, crowds, etc.). Sociocultural sustainability (CS) was measured using three items referring to perceived local heritage, social and cultural resources. Finally, five items related to the economic benefits of tourism for local communities and the investment in the economic development of destinations (infrastructures, handcrafts, tourist services, etc.) were used to measure economic sustainability (ES). We then invited a pilot sample of 40 undergraduate students who had previously visited some Mediterranean tourist destination to participate in the study. The results of the pilot test indicated that the survey instrument was reliable with an acceptable Cronbach's alpha. The items were also revised to ensure content validity. Following previous studies measuring sustainability in tourism as a multidimensional construct (e.g., Cottrell et al., 2013; Lee, 2013; Mathew & Sreejesh, 2017), all the items were measured using a Likert scale, rated from 1 (strongly disagree) to 5 (strongly agree). To find out the sample's descriptive variables, information was collected on gender, age, level of education (primary, secondary or university), and number of nights spent at the destination, approximate average spending per person and day, and reason for the visit. A list of the items may be found in Table 2.

Item quality was assessed using the item-total score correlations with SPSS v22.0 statistical software. No items were discarded since none of them showed low or no correlation (r value less than .3) with the total score. After this purification, exploratory factor analysis (EFA) (principal components analysis) with a varimax rotation was done of the items to outline the sustainability concept dimensions and

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analyze construct validity. All item loadings were 0.54 or higher on a single factor and were retained for further analysis. Only one item in the ES dimension (related to the municipal area's basic infrastructures) was deleted because of cross-loading. Table 2 shows the results of the final EFA. The findings were consistent with the three-dimensional proposal for the perceived sustainability construct. The KMO measurement of sampling adequacy was 0.88, suitable for factor analysis, and the result of the Bartlett test was significant at 0.01 confidence level (p<0.000). All the items showed factor loadings of .50 or over, with an average factor loading of 0.73 in a range of 0.54-0.88. Therefore, the construct's multi-dimensionality was confirmed, and the results demonstrated adequate convergent validity of the indicators. Scale reliability or internal consistency was determined by computing the Cronbach's alpha coefficient. All alphas exceeded Nunnally and Bernstein's (1994) recommendation of 0.70. Therefore, in this exploratory stage, findings indicated that the scale's psychometric properties were favorable. The results are shown in Table 2.

Table 2. Exploratory factor analysis of perceived sustainability

Items	Environmental Sustainability	Sociocultural Sustainability	Economic Sustainability
I have observed that the municipal area is investing to attract tourists	0.126	0.509	*0.576*
I consider that the municipal area has a good supply of handcrafts from the area	0.177	0.308	*0.651*
I consider that there is a good relationship between quality/price of tourist services in the destination	0.182	0.242	*0.772*
I think that the economic benefits of tourism in the municipal area are greater than the economic costs of tourism.	0.258	0.063	*0.807*
I think the heritage resources (monuments. etc.) in the municipal area are valued	0.249	*0.815*	0.241
I think the cultural resources (festivities. traditions etc.) in the municipal area are valued	0.120	*0.886*	0.160
I think that they are conserving local culture, cultural and heritage resources, and authenticity due to tourist activity	0.226	*0.782*	0.258
I have seen there is a campaign to encourage the conservation and responsible consumption of water	*0.543*	0.288	0.273
I think the level of pollution in the municipal area is acceptable	*0.853*	0.125	0.098
I think odors in the municipal area is acceptable	*0.745*	0.225	0.025
I think the cleanliness of the city and the main sights I have visited is good	*0.679*	0.256	0.220

I think noise in the municipal area is acceptable even with the influx of tourists	*0.802*	0.036	0.227
I think crowds are acceptable even at the height of the tourist season	*0.765*	0.000	0.180
I think the authorities promote energy savings and efficiency	*0.622*	0.311	0.220
Percentage of variance extracted	43.99%	13.60%	7.6%
Cronbach's alpha	0.87	0.87	0.78
Kaiser-Meyer-Olkin measure of adequacy		0.88	
Bartlett's test of sphericity		*p* < 0.000	

Latent class cluster analysis

Latent class segmentation (LC Cluster) using Latent Gold v4.5 software identified the

groups. This technique has been applied in several studies in the tourism industry (e.g.

Barroso-Castro et al., 2007; Díaz & Koutra, 2013; Landauer et al., 2012; Rondan-

Cataluña & Rosa-Diaz, 2012). LC cluster analysis differs from traditional cluster

analysis algorithms in that the former is based on the probability of classifying cases

and the latter relies on the nearest distance. Some scholars have demonstrated superior

performance of LC cluster analysis over traditional techniques in particular cases

(DeSarbo & Wedel, 1994; Rondan-Cataluña et al., 2010). As Rondan-Cataluña and

Rosa-Diaz (2012) emphasized, this technique, unlike conventional cluster segmentation,

can be used with nominal variables (Kamakura & Wedel, 1995). Another advantage is

the creation of *data-driven* or *a posteriori* segments (i.e., when the type and number of

segments are determined on the basis of the results of the data analyses), because *a

priori* segments (i.e., when the type and number of segments are determined in advance

by the researcher) may be distinct but "may be infeasible or insufficient to explain

differences in responses" (DeSarbo, Jedidi, & Sinha, 2001, p. 848). According to

Rigdon, Ringle and Sarstedt (2010), modelling segments based on a priori information

has serious limitations. In many cases, theoretical foundations of the segmentation bases

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are unavailable or incomplete. Moreover, observable characteristics (i.e., measured directly) such as age, gender, and income are often deficient in capturing heterogeneity (Wedel & Kamakura, 2000). Heterogeneity is frequently unobservable (i.e., inferred) and for an unknown cause, but LC cluster analysis provides a suitable probabilistic approach for survey responses, which enables unobserved heterogeneity to be analyzed (Vermunt & Magidson, 2005). Since perceived sustainability is a complex and subjective variable, it requires a special segmentation technique for analyzing unobservable and inferred characteristics. As unobserved heterogeneity is considered a more direct approach for uncovering subpopulations in a construct of interest (Tay, Diener, Drasgow, & Vermunt, 2011), we used this technique to uncover different subpopulations by tourist perceived sustainability of the destination as a basis for unobservable segmentation. Unlike other methods, the LC approach provides formal criteria for establishing the optimal number of segments. Thus, the smallest Bayesian Information Criterion (BIC) is used to determine the optimal cluster solution (Vermunt & Magidson, 2005).

The exploratory nature of this research in: (a) the development of a conceptual framework and a multidimensional measurement scale of perceived sustainability, and (b) the analysis of this notion as a segmentation criterion considering its multidimensionality, led us to use the factor scores on its three dimensions derived from previous exploratory factor analysis (EFA) as continuous input variables for latent class segmentation. Factor scores have been used in several segmentation studies (e.g., Konus, Verhoef, & Neslin, 2008; Maggioni, Marcoz, & Mauri, 2014; van Rijnsoever, Castaldi, & Dijst, 2012). Likewise, its suitability in specifying the existence of several underlying dimensions for a set of items in LC analysis has also been described in the

literature (e.g., Magidson & Vermunt, 2001). Finally, we added the sample descriptive variables as covariates to enable further characterization of the clusters identified.

Analysis and discussion

LC cluster analysis of the three dimensions of perceived sustainability was performed. The factor scores from the EFA were used as indicators in the latent-class model. The four-cluster model shows the minimum BIC (Vermunt & Magidson, 2005). Findings yielded an optimal solution of four tourist segments that minimize the BIC index —5950.34— (Table 3). The segmentation variables were significantly different in the four clusters as shown by Wald's test, as the p-value<0.05 indicated that all the effects associated with that indicator were not zero (Vermunt & Magidson, 2005) (see Table 4). Thus, all the indicators were significantly related to the four clusters.

Table 3. Selection of latent clusters

		LL	BIC (LL)	CAIC	Npar
Model 1	One-cluster	-3126.4741	6292.4982	6298.4982	6
Model 2	Two-cluster	-3009.2767	6209.7120	6238.7120	29
Model 3	Three-cluster	-2801.5485	5945.8640	5997.8640	52
Model 4	Four-cluster	-2718.9613	5932.2980	6007.2980	75
Model 5	Five-cluster	-2646.0203	5938.0245	6036.0245	98
Model 6	Six-cluster	-2580.0088	5957.6101	6078.6101	121

Table 4. Models for indicators

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Wald	p-Value
Environmental sustainability	0.1446	-0.1346	-1.0337	1.0237	900.7349	0.0000
Sociocultural sustainability	0.9182	-0.3258	0.1750	-0.7674	746.2023	0.0000
Economic sustainability	0.0294	-0.4444	0.1959	0.2190	114.2480	0.0000

Table 5 shows the description of the four latent clusters. Education, average spending and destination (country), as well as the three dimensions of perceived

sustainability, were statistically different in the four groups. No significant differences among segments were found for the rest of the descriptive variables analyzed.

Table 5. Description of segments

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Cluster size	0.4225	0.3211	0.1687	0.0876
Indicators				
Environmental sustainability	0.3129	0.0337	-0.8654	1.1919
Sociocultural sustainability	0.6806	-0.5634	-0.0626	-1.0050
Economic sustainability	0.1339	-0.3400	0.3003	0.3235
Covariates				
Gender				
Male	0.5251	0.5162	0.4060	0.4297
Female	0.4749	0.4838	0.5940	0.5703
Age				
Mean	39.0403	38.229	34.9477	37.686
Level of education*				
Primary	0.1553	0.0908	0.0725	0.0466
Secondary	0.4812	0.4774	0.3613	0.3057
College	0.3635	0.4318	0.5662	0.6476
Number of nights				
Less than 4 nights	0.6869	0.6461	0.2114	0.0001
Between 4 and 6 nights	0.0666	0.1065	0.0857	0.0000
More than 6 nights	0.2465	0.2474	0.7029	0.9999
Average expenditure person/day*				
Below €50	0.5030	0.4348	0.2078	0.5121
From €51 to €100	0.3429	0.4167	0.4204	0.3619
From €101 to €150	0.0841	0.1484	0.2465	0.0475
Over €150	0.0699	0.0002	0.1253	0.0785
Trip reason				
Leisure/holidays	0.7544	0.5228	0.5377	0.6746
Work/business	0.0456	0.2756	0.1009	0.0157
Visiting family/friends	0.1560	0.2013	0.3177	0.3097
Other reasons	0.0440	0.0003	0.0437	0.0000
Country*				
Spain	0.2703	0.0004	0.2490	0.0000
Lebanon	0.0583	0.0126	0.6840	0.0000
Tunisia	0.2625	0.2322	0.0002	0.9999
Italy	0.0221	0.6269	0.0192	0.0000
Jordan	0.3867	0.1279	0.0476	0.0000

Note: * Statistically different at level $p < 0.05$

The first group of tourists (42.25% of the sample, labelled *tourists with a high*

perception of sociocultural sustainability) shows positive perception of sociocultural

sustainability of the destination. Tourists who are included in this cluster highly value

the conservation of local culture, authenticity, and the heritage and cultural resources of

the destination. Perception of environmental sustainability, involving pollution, odors

and noise, cleanliness, overcrowding and/or energy saving in urban areas, are also

slightly positive. A significant percentage of the tourists in this group visited Tafilah

(Jordan) (38.67%), and also Cullera (Spain) and Maamoura (Tunisia) (over 25%). Some

of these destinations offer tour packages at affordable prices. This is reflected in their

low average spending during their visit. The profile of tourists with this particular

perception of sustainability can be described as having at least a secondary education

and spending few nights at the destination (fewer than four). Their average age was

higher than in the other groups.

According to the proposed conceptual framework illustrated in Figure 1,

destination marketing and DMOs must develop market-focused sustainability policies,

implying continuous information gathering about tourists' perceptions, followed by the

design, development and implementation of sustainability strategies adapted to the

different market segments. In the particular case of this cluster, several sustainability

policies related to the sociocultural dimension have been particularly reinforced in

recent years, probably as a consequence of the analysis of tourist evaluations and

demands. For example, the three cities, Tafilah, Cullera, and Maamoura, have made an

effort to conserve the historic part of the town, maintaining their heritage and historical

monuments. Cullera Castle, for example, was declared a National Monument and Asset

of Cultural Interest. As a result of implementing sustainability policies adapted to the

market, as described above in Figure 1, these strategies may have impacted on the

positive perception of sociocultural sustainability. Tafilah is not included in the "Jordan Trail" and there are no major hotels or real tourism infrastructure (e.g., parking lots, maintenance of historical or archaeological sites) (NewCiMed, 2017b). However, though this may seem negative, it could be the reason why sociocultural and environmental sustainability aspects are positively perceived. The lack of overcrowding in the city helps conserve sociocultural and environmental factors. Maamoura is considered clean and safe. It is not dangerous, has no contaminated places, or pollution of soil or groundwater (NewCiMed, 2017c). The positive perception of its environmental sustainability is therefore coherent.

The second cluster (32.11% of the sample, labelled *tourists with a low perception of sustainability*) shows slightly negative scores in their perception of the sociocultural and economic dimensions of the destination's sustainability. Conservation of the destination's heritage and cultural resources, investment in attracting tourism, or the price/quality and cost/benefit ratios of tourist services are not clearly perceived as sustainable. The tourist profile in this cluster includes mainly individuals who visited Latina (Italy) (62.69%) for a short period of time (fewer than four nights), and had low average spending (85.15% of the tourists spent less than €100 per day). The percentage of males was slightly higher in this group of tourists (51.62%). They had a university (43.18%) or secondary (47.74%) education, which is indicative of a medium-high sociocultural level. Latina was only included in the NewCiMed Project for the improvement and restoration of the original nucleus of the new town to enhance its features and be recognized as cultural heritage of humanity (NewCiMed, 2017d). Although many of the original buildings, monuments and squares are preserved in the historic city center, Latina underwent rapid urban expansion in the sixties and seventies. This resulted in a lack of adequate efficient infrastructure to serve its large population,

which coincides with the tourist's perceived sustainability, showing negative sociocultural and economic elements. This is in line with the conceptual framework shown in Figure 1, which highlights that cyclical creation of sustainability must be focused on market participants (tourists, residents, local businesses, etc.). Therefore, destinations with low tourist perceptions of sustainability must continually gather information about the market, investing resources in policies concerning aspects increasingly required by tourists, who at the same time, judge them negatively.

Members of Segment 3 (16.87% of the sample, labelled *tourists with a medium perception of economic sustainability*) showed low perception of the destination's environmental sustainability. Pollution, odors and noise, cleanliness, overcrowding or energy saving in the municipal area were negatively perceived. Perception in terms of the economic benefits of tourism at the destination, however, was slightly positive. A large percentage of tourists in this group travelled to Tyre (Lebanon) (68.40%) and some of them to Cullera (Spain) (24.9%), staying longer than six nights with average spending of €51 to €100 (42.04%). They travelled for leisure (53.77%) or personal reasons (31.77%). The percentage of women in this group was higher than men. Their level of education was mainly tertiary (56.62%) or secondary (36.13%), indicating a significant sociocultural level. Cullera and Tyre are modern cities with a historical heritage and attractive beaches. However, as the main economic sector of Cullera is tourism, it has led to a problem of seasonality. The growth of tourism can also generate environmental problems, causing negative perception of pollution, odors, noise or wasted energy. Although the environmental sustainability of Cullera is perceived as slightly positive in Cluster 1, tourists in Cluster 3 stayed longer than Cluster 1 and their level of education was higher than the first. This may have led to different perceptions, that is, the information, concern and awareness of environmental aspects may be higher

in Cluster 3. In Tyre, although Lebanon's Ministry of Tourism has shown a growing interest in developing and promoting responsible tourism since 2002 (Lebanon Traveler, 2012), not enough action has yet been taken in this regard. But they are concerned about the situation, and for example, have organized workshops to raise awareness of environmentally-friendly tourism (UNIFIL, 2012). Finally, according to the proposed conceptual framework (Figure 1), it is important to emphasize that destination managers and DMOs should continuously acquire knowledge about the origin of medium and low perceptions of some sustainability dimensions, and how to design future policies in order to increase low tourist perception.

The last segment (which only accounted for 8.76% and labelled *tourists with a high perception of environmental sustainability*) includes tourists with the highest perception of environmental sustainability. The destination's cleanliness, pollution, odors and noise, the perception of overcrowding or energy saving in the city are positively evaluated. On the contrary, these tourists show the worst perception of sociocultural sustainability of all the clusters. Conservation of the destination's heritage and cultural resources are negatively evaluated. Almost all respondents in this cluster had visited Maamoura (Tunisia) (99.99%), staying for many nights (longer than six) with low average spending during their visit. The percentage of women in this group was higher than men. Although their main reason for visiting there was leisure or vacation, a large percentage of respondents stated their intention to visit relatives or friends (30.97%). Most of the tourists have a higher (64.76%) or secondary (30.57%) education, interpreted as a high level of culture. Since these tourists are all visiting Maamoura, it is easy to surmise that the difficulties associated with this destination are related to its heritage and cultural resources. Maamoura is better known for its amazing beaches than for its historical heritage. Even though the old town and the most

important national institutions are in the city center, it does not seem to be well conserved. Enhancing the cultural heritage of the city was one of the reasons for including Maamoura in the NewCiMed project (NewCiMed, 2017c). To continue in this project in the future, a strategically-based marketing view of sustainability, as discussed above in our conceptual framework, is essential.

Another interesting result is that, at some destinations, such as Maamoura and Cullera, the sustainability of the destination was perceived differently depending on the tourist profile. Both destinations had groups of tourists in more than one cluster. Therefore, perception of the different types of sustainability at the same destination varied from one segment to another.

Conclusions and managerial implications

Although the notion of sustainability has been examined extensively in the literature on tourism, research devoted to achieving conceptual development of "perceived sustainability" has proceeded apace without a clear definition or measurement. In addition, as discussed under the proposed conceptual framework, the role of tourist perceptions in the design, development and implementation of sustainability strategies by destination managers constitutes a fundamental underpinning in the value co-creation process by organizations and consumers. However, sustainability strategies should be based on market orientation, and therefore, adapted to market segments according to their perception of sustainability. To the best of our knowledge, the multidimensional nature of this variable has not previously been analyzed in market segmentation studies.

This paper contributes to the existing literature in three ways. First, we provide a conceptual framework for perceived sustainability explaining the cyclical process which

forms it, and propose a definition and measurement scale for it. Second, we empirically validate a new scale measuring the perception of three sustainability dimensions, environmental, sociocultural and economic. Third, this study contributes to the literature on market segmentation in the tourism industry, since its empirical evidence suggests that the multidimensional concept of perceived sustainability could be used as a potential segmentation criterion. This comprehensive instrument was used as a basis for segmentation. Following new statistical advances, latent class segmentation was used to segment tourists according to their perception of all three dimensions of sustainability at the destination visited. This also enriches existing research on market segmentation in tourism, and enables the researcher to account for directly unobservable market heterogeneity through variables or items without prior theoretical predisposition. That is, instead of segmenting tourists according to traditional demographic variables, we have taken a step forward and analyzed whether there are groups of tourists with similar perceptions of the destination's sustainability, assessing the role of demographics and travel-related variables in identifying and describing tourist segments. We also explore the presence of segments of tourists with different perceptions of the sustainability of the same destination.

As expected, the results have verified that perceived sustainability is a variable that cannot be directly observed, and confirmed the discriminating power of its three dimensions. The findings revealed the existence of several latent clusters with different perceptions of sustainability. Each cluster is associated with a particular tourist profile, depending on education, average spending and the destination visited, but not in terms of gender, age, number of nights spent or reason for traveling. Another interesting result was that, in some cases, the sustainability of the same destination was perceived differently by different segments of tourists.

These results have several implications for destination managers and also for DMOs. First, knowledge of each of the three dimensions of tourist perceived sustainability should be taken into account as fundamental to decision-making on sustainability policies and strategies. In addition, adequate conceptualization and measurement of perceived sustainability can help destination managers and DMOs measure and evaluate the effectiveness or failure of their strategies by comparing sustainability actions and tourists' perceptions. Such knowledge is also useful for properly evaluating how attractive destinations are in terms of sustainability. Moreover, this research offers an exploratory approach to the design of sustainability and marketing policies at destinations based on market orientation. This implies that destination managers should take the analysis of tourists' perceptions and the identification of distinct market segments with different sustainability valuations into consideration before designing and implementing sustainability policies for specific targets. Thus, managers in tourist destinations would be able to improve their sustainability programs by developing specific actions for particular segments in order to increase perception of economic, sociocultural and environmental sustainability. Knowledge of the market would help managers develop positioning and communication strategies by adapting marketing campaigns to each market segment according to their perceptions of sustainability. Selection of relevant issues, appropriate visual images, and adapted messages, for example, would create positive expectations in different market segments, and ultimately, favor consumer decision-making and the value co-creation process by destination managers and tourists. Finally, this research highlights the importance of knowing the perceived sustainability of tourist destinations because of the tendency of tourists to make decisions based on perceptions rather than objective indicators (Roehl & Fesenmaier, 1992), and to use those perceptions as when selecting

the destination (Amir, Ismail, & See, 2015). Therefore, it is not enough to be sustainable. Tourists must perceive it.

For economic sustainability, destinations could focus on manmade capital, such as infrastructures (e.g., roads, railways and buildings), human material welfare, employment and livelihoods. If this element of sustainability is well perceived, marketing strategies such as advertising or positioning should highlight the contribution of tourism to the destination's economic progress. Environmental sustainability could be improved by taking action related to the responsible consumption of natural resources, pollution, cleanliness, odors and noise and energy saving strategies. Additionally, where environmental perception of the destination's sustainability is good, managers and local government could take advantage of it as a tool for commercial communication to attract new pro-environmentally-oriented tourists. These individuals would be more open and receptive to positioning strategies that emphasize the unique natural beauty of the destination. Tourist agents at destinations with sociocultural sustainability should focus their strategies on improving the sustainability of local culture and heritage resources, as investing in them would improve the sustainability of the destination as a whole. In any case, communication programs are essential for improving and reinforcing the perceived sustainability of such destinations, while promoting stronger attitudinal and behavioral engagement in developing pro-environmental actions and minimizing the negative consequences of tourism.

Limitations and future research

This study has several limitations that should be considered in further research. First, it is important to clarify that this research is exploratory and aimed at conceptualizing and operationalizing the notion of perceived sustainability in tourist destinations, as a

preliminary stage in the development of a scale that can be applied to all type of tourists and sustainability policies. In line with previous studies (e.g., Cottrell et al., 2013; Lee, 2013; Mathew & Sreejesh, 2017), we acknowledge the lack of generalization of the proposed measurement instrument. Therefore, the perceived sustainability scale should be refined in futures studies. Second, it is important to highlight that perceptions are highly subjective, situational, and dependent on people's needs, values and expectations. Therefore, since we used convenience sampling, the results should be considered with caution. Further studies are needed in different contexts and circumstances, using probabilistic sampling procedures. Alternative operationalization of perceived sustainability could also be explored, including other specific dimensions of sustainability such as political and technological sustainability (O'Connor, 2006). Third, data collection was cross-sectional. Longitudinal studies are needed to validate the scale and test potential variation in the segmentation results. Another limitation is use of the factor scores instead of the initial list of items in the segmentation analysis. It would be of interest to include a comprehensive list of items to identify additional classes and more subtle differences that cannot be uncovered because of having used aggregated scores.

In addition, further studies analyzing its effect on tourist behavior and decision-making would be necessary for a comprehensive demonstration of its suitability as a segmentation criterion. More research is also required to compare sustainability perceived by tourists and local residents (Tsaur, Lin, & Lin, 2006). Future research should also analyze the relationship between perceived sustainability and other variables, such as satisfaction or behavioral intentions, using other segmentation techniques (e.g., latent class regression).

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