

Cita bibliográfica: Gutiérrez, A., Saladié, O., & Clavé, S. A. (2018). High-speed rail and tourism destination choice: the role and significance of the Camp de Tarragona station for passengers visiting the Costa Daurada. *Boletín de la Asociación de Geógrafos Españoles*, 76, 479-503. doi: 10.21138/bage.2531

High-speed rail and tourism destination choice: the role and significance of the Camp de Tarragona station for passengers visiting the Costa Daurada

Alta Velocidad ferroviaria y elección de destino turístico:
la incidencia de la estación de Camp de Tarragona
sobre los pasajeros que visitan la Costa Dorada

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Abstract

We analysed how the availability of high-speed rail (HSR) services affects destination choices among tourists who have arrived by HSR. To that end, we used data from a survey of travellers at Camp de Tarragona Station in Catalonia, Spain, and applied a probabilistic method to measure the increase in probability of visiting the Costa Daurada due to the existence of the HSR station. Results demonstrated a slight increase in the probability of visiting the destination (14.1%), which varied

significantly according to the sociodemographic profile of tourists and the characteristics of their travel and stays.

Key words: high-speed rail; tourism; destination choice; peripheral station; the Costa Daurada.

Resumen

El artículo analiza la influencia de la disponibilidad de servicios de Alta Velocidad Ferroviaria en la elección del destino entre los turistas que utilizan este medio de transporte. A partir de datos provenientes de encuestas a viajeros de la estación del Camp de Tarragona se ha aplicado un método probabilístico que ha permitido medir el incremento de probabilidad de visitar la Costa Dorada causado por la existencia de esta estación. Los resultados demuestran un leve incremento de la probabilidad de visitar el destino (14,1 %). Se ha demostrado también que este incremento de probabilidad varía significativamente en función de las características sociodemográficas del turista, del viaje y de su estancia.

Palabras clave: Alta Velocidad Ferroviaria; turismo; elección de destino; estación periférica; Costa Dorada.

Acknowledgements: Research funded by the Spanish Ministry of Economy and Competitiveness (GLOBALTUR–CSO2011–23004/GEOG; MOVETUR-CSO2014-51785-R).

1 Introduction

Transport infrastructure plays a strategic role in tourism development and destination competitiveness (Lumsdon & Page, 2004; Page, 2005). As Prideaux (2000) has pointed out, travel time, accessibility, connectivity, and affordability are all critical factors of destination development, and now also relevant are traveller perceptions of the safety, comfort, and quality of the destination. Although some researchers have recognised the increased attractiveness of destinations due to improvements in transport infrastructure (Khadaroo and Seetanah, 2008), others have negatively qualified the impact of increased tourist mobility due to such improvements. In research frameworks used to gain insights into the topic, the most common approaches focus on how increasing of tourism pressure has contributed to social inequality at the destination (Hall, 1999), local transport congestion, and competition for services among residents and tourists (Albalade & Bel, 2010), whereas others have stressed their deep environmental impact (Peeters et al., 2007).

Since air transport has often been highlighted as the key mode of transport for tourism development, most research to date has tended to concentrate on air transport (Bieger and Wittmer, 2006; Duval, 2013). By contrast, the exploration of relationships between railways—high-speed rail (HSR) in particular—and tourism remains relatively underdeveloped (Delaplace et al., 2014). Nevertheless,

recent studies have emphasised the growing role that tourism and leisure have in the different travel motivations of HSR passengers (Bazin et al., 2013; Santos et al., 2007). Consequently, the door has opened for analysing recreational tourist flows related to mode of transport, though the topic was once dominated by business mobility (Bazin et al., 2011; Behrens & Pels, 2009).

Literature on HSR agrees that the mode of transport is more competitive for mid-distance trips. Ureña et al. (2009) have highlighted how, in territories with consolidated HSR networks, it has been possible to observe travellers changing from private cars to HSR for short- or mid-distance trips (100–400 km) and from air transport to HSR for mid- to long-distance ones (400–700 km). In fact, recent studies have also highlighted that a chief effect of the recent extension of the HSR network in Europe has been its capacity to attract passengers away from airlines (Dobruszkes et al., 2014; Givoni & Dobruszkes, 2013). That trend suggests that the primary effects of HSR have tended to take hold in changes in mode of transport, not in creating a greater degree of mobility. Consequently, the capacity to attract new travellers to a specific destination due to the introduction of new HSR services could be less than anticipated (Albalade & Fageda, 2016). At the same time, the influence of HSR on destination choice remains an undeveloped field, with a particular lack of empirical ex-post evaluations of the capacity of HSR to attract visitors to tourist destinations.

In response, we aimed to investigate the effects of HSR services on destination choice in the Mediterranean mass tourism destination of the Costa Daurada. More specifically, we sought to analyse the influence of the presence of HSR services at Camp de Tarragona Station on the choice of destination of HSR passengers visiting the Costa Daurada on holiday and travelling there by train. To date, exceptionally few studies on destination choice have also addressed HSR services, with notable exceptions including Delaplace et al. (2014) on Paris and Rome, Plaghiara et al. (2015) on Madrid, and Saladié et al. (2016) on first-time and repeat tourists on the Costa Daurada.

We used a causal probabilistic method developed by Young et al. (2005) and previously applied by Fernandez Young and Young (2008) to analyse tourism in the specific context of film tourism, by Pratt et al. (2010) to evaluate the effectiveness of tourism marketing campaigns, by Young et al. (2010) in the context of cultural tourism in market towns, and by Saladié et al. (2014) and Anton Clavé et al. (2015) to assess the influence of the availability of a low-cost flight route on tourists' choices regarding a specific destination. Less conventionally, we used a coastal destination as a study area, which represents a type of context relatively ignored in literature on the local and regional effects of providing HSR services.

This paper contains six sections organised as follows. Section 2 contains a review of literature on the relationship between HSR and tourism, after which in Section 3 we present our method and described the data used. In Section 4, we introduce the study area and underscore the chief characteristics of the territorial context as vital to interpreting our findings. Two particularly key issues

highlighted in that section are that the study occurred in a mature coastal destination where HSR services are available at a peripherally located station only. After we present the results in Section 5, we close the paper in Section 6 with some concluding remarks and by identifying future research topics indicated by our results.

2 Background

Literature on the relationship between HSR and tourism has presented several highly controversial findings. Some studies have stressed the impossibility of generalising tourism development patterns associated with the extension of HSR networks (Delaplace, 2012; SEEDA, 2008; Todorovitch et al., 2011), whereas others have highlighted the positive effects of HSR on the tourism attractiveness of some destinations, especially larger urban areas (Pagliara et al., 2015). Improved accessibility (Vickerman et al., 1999), reduced travel time (Gutiérrez, 2004; Menerault, 1998), and even reduced travelling costs have all helped to enlarge the potential market available to every city connected to the HSR network (Ureña et al. 2009; Wang et al., 2012). The results have been new opportunities for tourism (Coronado et al., 2013; Gil Álvarez, 2010; Masson & Petiot, 2009), new competition among territories (Facchinetti-Mannone et al., 2013; Garmendia et al., 2012), and improved services and facilities in areas connected by HSR services (Bellet et al., 2012; Bruinsma et al. 2008).

Studies on the European context have focused on the role of HSR services in the growth of urban and business tourism (Bazin et al., 2011; Masson & Petiot, 2009) associated with travel to major cities (Delaplace et al., 2014; Pagliara et al., 2015). Moreover, albeit scarce, literature on the influence of HSR on tourism in mid-sized cities or intermediate nodes of the network, if not both, has often reflected a relatively limited increase in tourist flows (Facchinetti-Mannone et al., 2013). In those cases, only the existence of specific strategic policies at the local scale has proven to be a key factor in maximising the impact of an HSR station (Bellet et al., 2012; Feliu, 2012; Gil Álvarez, 2010). Differences between territories can be explained by both the specific attractiveness of certain locations and the presence of development policies that specifically promote and encourage tourism (Delaplace, 2012; Todorovitch et al., 2011). Mass tourism destinations such as coastal areas, theme parks, and winter sport resorts currently remain relatively understudied contexts. By contrast, literature on HSR and tourism in Asia has tended to use global, national, or corridor-scale analyses instead of in-depth case studies (Chen & Haynes, 2012, 2015; Wang et al., 2012; Wang et al. 2014; Wang et al., 2010).

Theoretical and ex-ante approaches continue to be the predominant approximations in attempts to evaluate the impact of HSR on increasing the tourism attractiveness of a given destination. Such studies have been conducted in countries where the expansion of the HSR network was either planned (e.g., Spain, France, and China) or subject to public debate (e.g., the United States).

Within that approach, Masson and Petiot (2009) have used the core–periphery model to argue that the introduction of HSR services between Perpignan, France, and Barcelona, Spain, would stimulate and facilitate tourism, especially business-related and urban tourism. Using a gravitational model to forecast the impact of HSR on international tourism in the Chinese market, Wang et al. (2012) highlighted the effects of HSR on increasing the competitiveness of connected cities and the subsequent redefinition of patterns of urban tourism in those territories. Among other research, Becker and George (2011) examined the perceptions of potential consumers regarding a proposed HSR service through the Gulf Coast region of the United States to conclude that the planned infrastructure would help to create opportunities for more integrative tourism development in the region. More recently, Guirao and Campa (2015) adopted a different perspective—the impact of tourism on HSR corridors—and used a multicriteria approach that situated tourism attractiveness as a key variable for ranking corridors that provided the highest potential demand in Spain’s HSR network.

Ex-post studies based on empirical data have provided largely complementary results, albeit ones that in some cases have differed, thereby underscoring that the field is a rather controversial one in which a spectrum of factors, especially related to territorial context, need to be considered. In the Spanish context, a survey by Guirao and Soler (2008) found that in the case of Toledo, 30% of passengers arriving by HSR between Madrid and Toledo were tourists. Bazin et al. (2011) also used a survey of HSR passengers to show that the daily level of expenditure of business tourists using the Paris–Lyon line was up to four times greater than that of leisure travellers, even though the former tended to make shorter stays. In addition to those case studies, Chen and Haynes (2012) used multivariate panel analysis to argue that during 1999-2010, Chinese provinces with HSR services received 20% more international tourists and 25% more revenue than those without them. By contrast, Albalade and Fageda (2016) used data of the evolution of overnight stays in hotels in Spanish cities served by HSR during 1998-2013 to argue that the provision of HSR services did not alone promote any great tourist activity, thereby showing that cities served by HSR did not experience any significant change in total number of overnight stays following the introduction of HSR services.

So far, few studies have analysed the impact of HSR on the choice of tourist destinations. Delaplace et al. (2014) studied those effects in Rome and Paris by using data from questionnaires given to tourists visiting both cities, after which they used regression models to obtain evidence demonstrating that the influence of HSR on destination choice differed from city to city. More recently, Pagliara et al. (2015) studied the influence of HSR services on decisions to visit Madrid and its neighbouring cities, also by using data from surveys conducted with tourists visiting each city and regression models to analyse the respective roles of explanatory variables that could affect the choice of

destination. Ultimately, they concluded that the effects of HSR were greater in mid-sized cities connected to Madrid by HSR than in Madrid itself.

3 Study area

The Costa Daurada, which is 100 km south of Barcelona, ranks among the most dynamic tourist destinations in Catalonia. It offers a mild climate, fine sand, clear water, and proximity to several UNESCO World Heritage sites and other places of historical and cultural interest. Salou is the best-known location in the area, which, along with the adjacent municipalities of Cambrils, Vila-seca, and La Pineda, forms the centre of the Costa Daurada. That area, which is within 10 km of the cities of Tarragona and Reus, with respective populations of 132,000 and 104,000, had more than 80,000 permanent residents as of 2014 and hosted more than 4.6 million tourists that same year, both registered and unregistered accommodations (Gutiérrez & Miravet, 2016). The neighbouring PortAventura World, a theme park which opened in 1995, is currently among the five largest theme parks in Europe and receives more than 3.5 million visitors per year (Rubin, 2015). The area is well connected to France and other parts of Spain's Mediterranean territory via the AP-7 motorway and to the western part of the Iberian Peninsula and Madrid via the AP-2. Tourists can also arrive by means of airports in Barcelona and Reus, and since 2007, via Camp de Tarragona HSR Station.

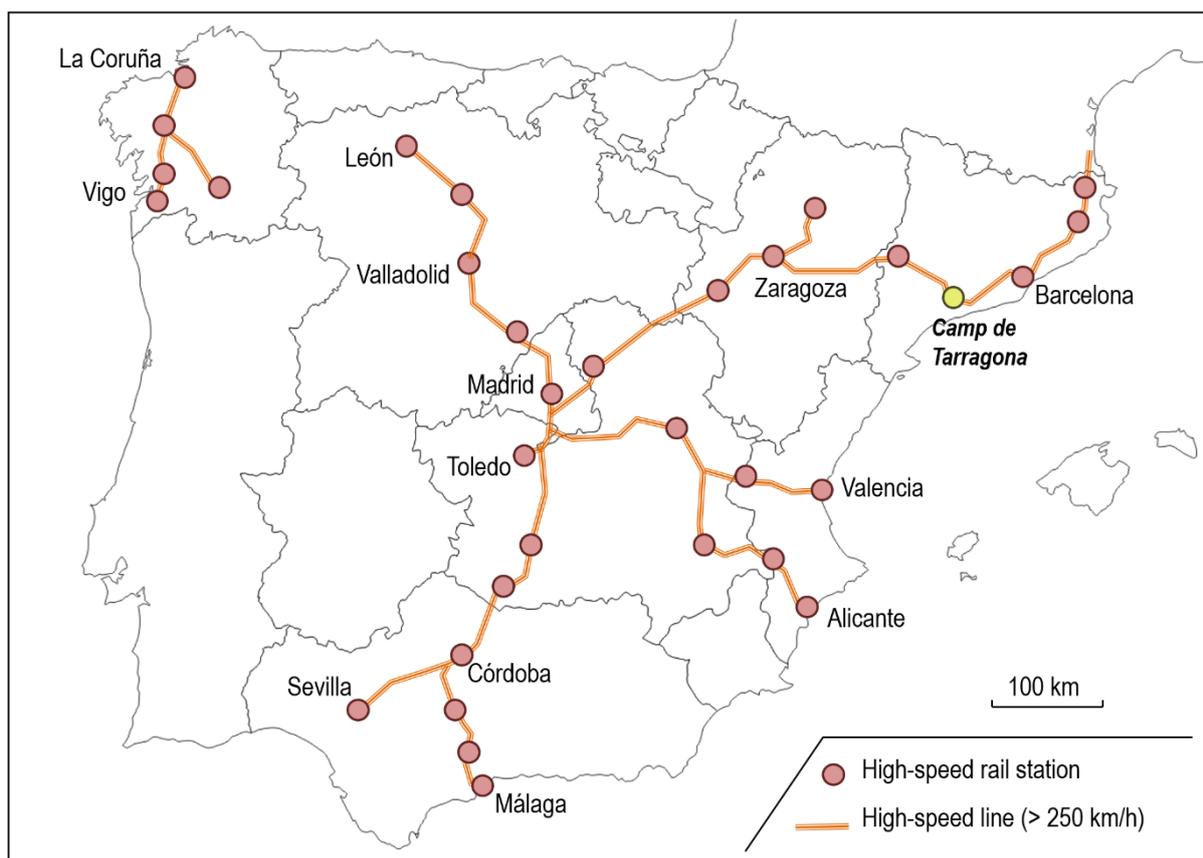
According to regular surveys of tourists conducted by the Costa Daurada Tourism Studies Foundation,¹ 57% of those visitors have been Spaniards and 43% foreigners. For Spanish visitors, private car has been the primary mode of transportation used to reach the destination (75%), followed by train (9% in total: 5% on conventional rail services and 4% on HSR). Bus (8%), plane (7%), and other modes of transport (1%) have been tertiary options for Spaniards travelling to the Costa Daurada. Importantly, the use of HSR to reach the destination has shown significant growth in recent years, for it was only 1.5% in 2010. Regarding type of accommodation used, 49% of Spanish tourists have stayed in second homes, 39% in hotels, 9% in rented apartments, and 3% at campsites. Repeat tourists have formed the clear majority (83%) of the tourists, whereas only 17% have been first-time visitors. Their average length of stay has been 7.8 nights, although that figure would be 14.7 nights if the sample included extended-stay tourists who stayed for more than 30 days at second homes.

Camp de Tarragona HSR Station is an intermediate node on the Madrid–Barcelona–French border HSR line (Figure 1). It has a peripheral location, at 14 km and 17 km, respectively, from the cities of Tarragona and Reus and at roughly 20 km from the chief tourist destinations on the coast (Figure 2). As with other peripherally located stations in Spain and France (Bellet & Gutiérrez, 2011; Facchinetti-Mannone, 2005; Ribalaygua, 2006), the greatest deficiency in the service provided is the lack of

1 Retrieved from http://www.pct-turisme.cat/eng/innovation_fetcd.html

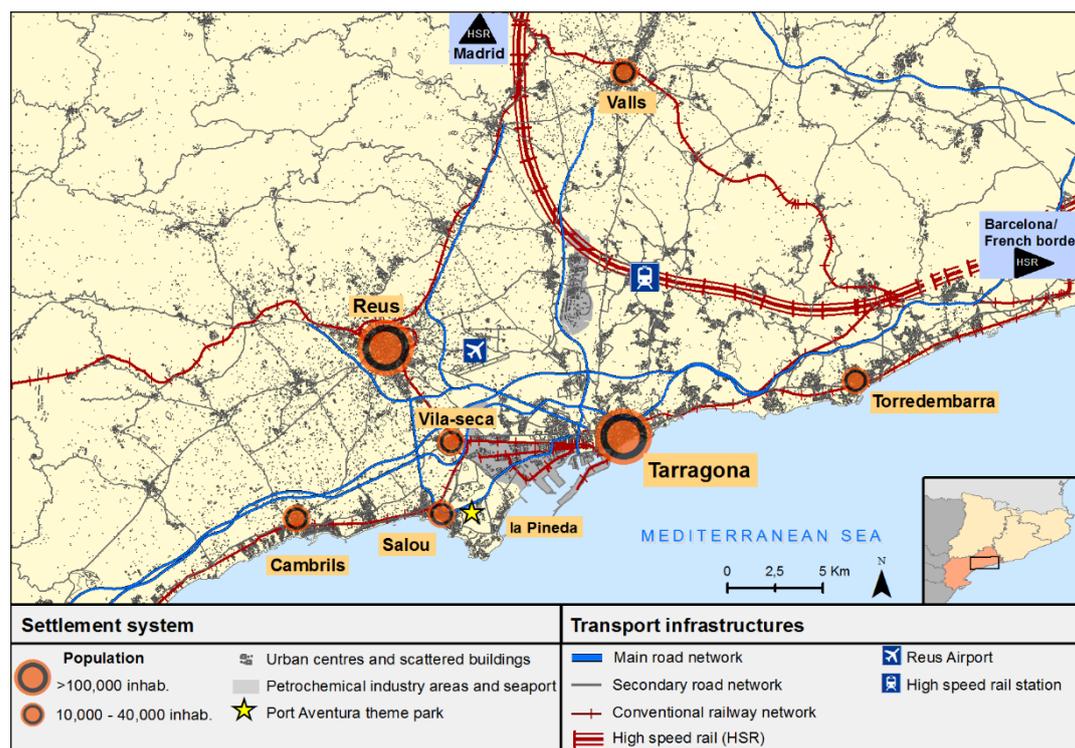
accessibility due to poor connectivity with the regional public transportation network (Gutiérrez, 2009). A common solution in other peripheral stations has been the provision of a shuttle service between the station and the city centre. In the case of Camp de Tarragona Station, the polycentric, scattered settlement structure of the region implies added difficulty for connections by means of public transport. In fact, it implies that many urban areas of the region lack a direct public transportation service to the station. However, despite such poor accessibility, according to data provided by Renfe Operadora, Spain's national rail company, Camp de Tarragona is the ninth most-frequented station in Spain's HSR network and the most important peripheral station in terms of number of passengers (831,700 in 2015). The annual distribution of passengers at the station shows a marked seasonality that contrasts the general flow pattern observed at the rest of Spain's HSR stations; the greatest number of passengers is received in the summer, whereas the Spanish HSR network as a whole tends to experience a decline in passengers at that time of year. That dynamic further underscores the importance of the Costa Daurada as a tourist destination.

Figure 1. Camp de Tarragona Station within the Spanish high-speed rail network



Source: authors

Figure 2. Study area



Source: authors

4 Data and methods

We based our study on a survey conducted between 13 July and 24 August 2014 at Camp de Tarragona Station among 1,225 passengers. The number of surveys gathered stemmed from the objective of obtaining at least a 95% confidence level and 5% margin of error. The total number of passengers who used Camp de Tarragona Station during the same period in 2013 was used as a reference for our calculations.²

Since the vast majority of HSR passengers at Camp de Tarragona Station were Spaniards (>95% of those surveyed), we discarded foreigner passengers from the sample. We also excluded passengers from Spain who were not returning home via Camp de Tarragona Station, who did not report tourism as their chief reason for travel, who did not spend holiday along the Costa Daurada, or who did not answer questions crucial to our method. Ultimately, 574 Spanish tourists returning home by means of HSR after holidaying at a main location on the Costa Daurada formed the sample (46.9% of all surveyed).

We asked those 574 passengers questions about their sociodemographic characteristics and the nature of their trips. In the first section of the interview, questions addressed age, sex, region of origin in Spain, and level of education. In the second section, we addressed the number of days in

² The data relating to the number of passengers were supplied by RENFE.

advance that they booked their trip, whether they made bookings themselves or used a travel agency, the size of the group and its structure, the length of their stay, whether it was their first visit to the destination, whether they had used Camp de Tarragona Station on previous occasions, their final destination on the Costa Daurada, the type of accommodation that they had chosen, and how they travelled from the HSR station to their accommodation. As previously indicated, the survey also included two causal questions:

1. On a scale from 0 to 10, to what extent do you agree with the following statement? 'I chose the Costa Daurada as a tourist destination because of the existence of Camp de Tarragona HSR Station' (0 = Disagree entirely, 10 = Agree entirely).
2. On a scale from 0 to 10, to what extent do you agree with the following statement? 'I would have chosen the Costa Daurada as a tourist destination even if Camp de Tarragona HSR Station had not been there' (0 = Disagree entirely, 10 = Agree entirely).

The combined answers to those two questions allowed us to measure the influence of Camp de Tarragona Station on tourists' decisions to visit the Costa Daurada. We used a causal probabilistic method developed by Young et al. (2005) and adapted by Saladié et al. (2016). The existence of a HSR station near a tourist destination might have justified visiting the destination, though not necessarily be linked to any individual decision to visit the particular destination given the various modes of transportation available. Furthermore, the mere existence of an HSR station cannot alone motivate a visit; many potential visitors choose not to make visits despite the existence of such stations. Thus, the decision to visit a particular destination is the result of an aggregation of the fractional effects of several different causal stimuli; the existence of an HSR station simply adds a string of logical events that could result in a visit to a particular destination. However, and as stated above, that circumstance does not guarantee that the visit will occur; some other events also have to occur for a visit to take place. Moreover, the visit to the destination could have occurred regardless of the existence of the HSR station. In short, a visit takes place only if a complete path from the origin of events to the outcome exists. According to Young et al. (2005), that conception of causality contrasts that of the so-called injection model, in which a specific cause is sufficient or even necessary to provoke a specific outcome.

Those two types of uncertainty present two different causal probabilities. The first is the probability related to causality: the probability of the visit's taking place based on the highlighted cause (i.e., the existence of the HSR station). The second is related to causation: the probability that, without the existence of the HSR station, no visit to the destination would occur. Thus, from Equation 1, $P(V|S)$ is the probability of somebody's actually visiting a given tourist destination when a HSR station is nearby, and $P(V|\sim S)$ is the probability of their making the visit if a station had not been nearby. The difference is the increase in the probability (Δp) of visiting the destination created by the presence of

the HSR station; it is the probability of the visit's occurring given the existence of the HSR station ($P(V|S)$), minus the probability of the same visit if the HSR station had not existed ($P(V|\sim S)$).

$$\Delta p \equiv P(V|S) - P(V|\sim S) \quad (1)$$

In that way, Question 1 intended to elicit the probability of the visit's being made due to the existence of the HSR station: the probability in causality (i.e., k_i in Equation 2). Meanwhile, Question 2 intended to elicit the probability of the tourist's having come to the destination regardless of the HSR station ($1 - c_i$) or, as defined by Young et al. (2005), the background probability. That relationship means that c_i (Equation 2) is the probability of there not having been a visit without the existence of the HSR station.

$$\Delta p_i = k_i * c_i \quad (2)$$

The two questions asked to each HSR passenger provided quantitative empirical evidence about the level of influence exerted by Camp de Tarragona HSR Station on destination choice. In Question 1, 0 meant that there was no influence and 10 that the visit was solely due to the existence of the HSR station. By contrast, if a tourist gave a score of 10 in Question 2 ($c_i = 0$), it indicated that they would have chosen the Costa Daurada as their destination regardless of the existence of Camp de Tarragona HSR Station and that we could therefore not assign any contribution of the station to the choice of destination. When the answer to Question 2 was 0 ($c_i = 10$), it meant that the visit would not have occurred without the existence of the station. The two factors in Equation 2 (k_i and c_i) assess the effect of the availability of the HSR station on the choice of destination in different ways, and as Fernandez Young and Young (2008) have indicated, the net effect is expressed by their product (Δp_i).

Despite the numerous possible combinations of answers to both questions, we generally expected that respondents who provided a number close to 0 for Question 1 would also tend to give a number close to 10 in response to Question 2 and vice versa. For example, if an interviewee responded with a score of 2 to Question 1 (i.e., the influence of the HSR station on their choice of destination was low) and 8 to Question 2 (i.e., it was very likely that the visit would have occurred without the existence of the HSR station), then the increase in the probability of using HSR services to visit the destination attributable to the existence of the HSR station would be 4%. In that example, k_i^3 is 0.2, $1 - c_i$ is 0.8, and therefore, c_i is 0.2 ($1 - 0.8$). Hence, Δp_i is 0.04. According to that logic, the extremes of the range of responses would be from, one on the one hand, visitors stating that the existence of the HSR station bore no influence whatsoever on their decision and that they definitely would have visited the destination regardless of the presence of the station (k_i and c_i values

3 The values of k_i , $1 - c_i$, and c_i range from 0 to 1.

equal to 0) to, on the other, visitors stating that they would not have chosen the destination if the HSR station had not been there and decided to book their visit due to its existence (k_i and c_i values equal to 1). In the first case, the HSR station bore no influence whatsoever on making the visit more likely, whereas in the second, its existence increased the probability of the visit from 0 to 1.

In sum, Δp_i (Equation 2) is the fraction of the individual visit of each HSR passenger interviewed that can be attributed to the existence of the HSR station. The equation allowed us to measure the result for the whole sample (Δp in Equation 3), or for a defined segment, as the mean of the individual values.

$$\Delta p = \sum_{i=1}^N (k_i * c_i) / N \quad (3)$$

5 Profile of HSR passengers visiting the Costa Daurada

The distribution of HSR passengers visiting the Costa Daurada in the sample according to their sociodemographic profiles and travel behaviour appears in Tables 1 and 2, respectively. The sample was predominately female (57.6% of those surveyed). The average age of respondents was 41 years old, with male passengers' being slightly younger than their female counterparts (40 and 43 years old, respectively). Almost 40% of the HSR users surveyed were between 26 and 40 years old, while 34.8% were aged between 41 and 60 years. The youngest HSR users (aged 18-25 years) accounted for 15.4% of those surveyed, while only 11.5% of the passengers were older than 60 years.

Madrid was the Spanish region that contributed the greatest number of passengers (37.5%), followed by the autonomous communities of Aragon (20.9%)—the region closest to Catalonia connected by HSR—Navarra (10.5%), Catalonia (9.6%), Andalusia (6.8%), and the Basque Country (5.9%). Thus, two Spanish regions accounted for more than half of HSR passengers who visited the Costa Daurada. The trip between the Madrid—Puerta de Atocha and Camp de Tarragona HSR Stations takes 150 min, whereas the HSR journey between the Zaragoza—Delicias (capital of Aragon) and Camp de Tarragona HSR stations takes 80 min.

On average, respondents decided on using HSR for their trips about 2.5 months in advance, and most users booked their journeys themselves. The availability of frequent HSR services made it possible to reduce the time between making decisions about travelling for holidays and making the journeys. Moreover, half of respondents stated that they travelled alone, perhaps attributable to the flexibility of HSR trips and that there are more scheduled train services than, for example, flights covering a given trajectory. In fact, the most frequent travel structure was a passenger who travelled alone. Passengers with the largest group sizes had the least weight in the sample; one in five trips were made with another person, but only 6.1% of the total as part of a group of more than four

people. The most common party structure for passengers who travelled in groups was that of a family with children or adult relatives, if not both.

Table 1. Distribution of passengers interviewed by sociodemographic characteristics

<i>Sex</i>		<i>Age (in years)</i>	
Female	57.6%	Mean	41
Male	42.4%	18–25	15.4%
<i>Origin</i>		26–40	38.3%
Catalonia	9.4%	41–60	34.8%
Aragon	20.9%	>60	11.5%
Madrid	37.5%	<i>Education level</i>	
Navarra	10.5%	None	1.3 %
Andalusia	6.8%	Primary school	13.1%
Basque Country	5.9%	Secondary school	19.1%
Elsewhere in Spain	9.0 %	University	66.5%

Source: authors

Since most HSR users had previously visited the Costa Daurada (88.7%), Camp de Tarragona HSR Station has not generated a significant number of new tourists. Nevertheless, it is possible to highlight a change in the mode of transportation used, for more than a third of repeat users had not previously used the HSR station to reach the Costa Daurada.

Salou was the destination most frequently chosen by respondents, a quarter of whom were travelling there. Salou, Cambrils and La Pineda, which forms the central Costa Daurada, were together the destinations chosen by more than half of the travellers using Camp de Tarragona HSR Station. Even so, we need to highlight that more than a third of passengers interviewed stayed at locations outside central Costa Daurada or Tarragona, although none of those other destinations attracted more than 5% of visitors. That last fact related to the type of accommodation provided, given a preponderance of private accommodations (e.g., second homes) in the area. Nearly 20% of travellers stayed in their own accommodations, which was the case for four of every 10 groups of friends or relatives. Such accommodations were particularly popular among passengers staying in the area that we can call the 'rest of the Costa Daurada'. For the entire sample, only a quarter of passengers interviewed chose to stay at a hotel, perhaps partly due to the fact half of the passengers travelled alone, and most of them stayed in private accommodations, suggesting that they travelled alone from their place of residence to a destination that their family or friends had previously reached. That dynamic would also explain why two thirds of HSR users surveyed had moved from Camp de Tarragona HSR Station to their final destination on the Costa Daurada by car driven by a relative or friend. Yet, since the lack of efficient public transport services to the coastal destination is another key factor to explain that situation, other transport modes for the transfer from the station to the final destination played a secondary role; 18% of passengers took a taxi, 15% travelled by bus, and 3% used other modes of transport (e.g., hotel transfer or rental car).

The average length of stay among respondents was 8.2 nights, albeit with significant differences regarding the type of accommodation chosen. Average stays ranged from 5.5 nights in hotels to 11.2 in visitors' own accommodation.

Table 2. The distribution of passengers according to travel characteristics

<i>Time in advance that the trip was planned</i>		<i>Booking</i>	
Mean	75 days	Travel agency	12.4%
<i>Group size</i>		Booked by themselves	87.6%
One	50.0%	<i>First visit to the destination?</i>	
Two	22.8%	Yes	11.3%
Three	12.6%	No	88.7%
Four	8.5%	<i>Previous use of the HSR station[†]</i>	
More than four	6.1%	Yes	64.8%
<i>Party structure</i>		No	35.2%
Adult travelling alone	50.0%	<i>Type of accommodation</i>	
Family with children	20.2%	Hotel	25.1%
Adult with relatives	19.7%	Campsite	3.5%
Adult with friends	10.1%	Accommodation belonging to friends or relatives	40.6%
<i>Final destination</i>		Own accommodation	19.5%
Salou	25.5%	Holiday rental	8.5%
Cambrils	18.7%	Other	2.8%
Tarragona City	14.7%	<i>Transfer from the HSR station</i>	
La Pineda	6.6%	Friends or relatives (by car)	63.5%
Rest of the Costa Daurada	34.5%	Taxi	18.0%
<i>Length of stay</i>		Bus	15.5%
Mean	8.2 nights	Other	3.0%

Key: † Only repeat tourists

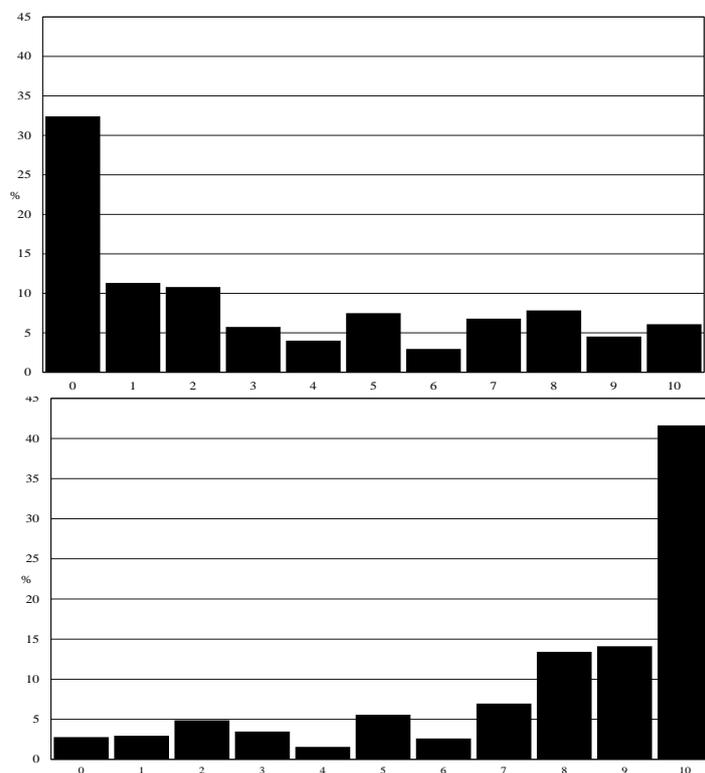
Source: authors

6 Influence of HSR services on destination choice

The distribution of answers to the two causal questions given by HSR users who arrived at the Costa Daurada via Camp de Tarragona HSR Station appears in Figure 3. Nearly a third of passengers (186) gave a score of 0 in response to Question 1, thereby categorically denying that they had travelled to the Costa Daurada because of the station (Figure 3). Only two other scores (1 and 2) were given by more than 10% of respondents. Consequently, Camp de Tarragona HSR Station itself either exerted no influence or only very minor influence on the choices of more than half of the passengers questioned. Conversely, only 35 (6.1%) of respondents stated that they had chosen the destination because of its HSR station (Question 1 = 10). The influence of the HSR could only be interpreted as very high (Question 1 = 8 or 9) in 71 cases. By contrast, 239 passengers (41.6%) gave a score of 10 in answer to Question 2 (Figure 3), thereby stating that that they definitely would have visited the Costa Daurada even if Camp de Tarragona HSR Station had not existed. As with

Question 1, only two of the other scores given accounted for more than 10% of replies (8 and 9). The aggregate of those three scores (10, 9, and 8) in response to Question 2 therefore represented more than two thirds of the replies. Only 16 passengers (2.8%) responded to Question 2 with a score of 0, thereby signifying that they would not have visited the destination if there had not been a HSR station. Similarly, very few passengers gave scores of 1 or 2 in response to Question 2.

Figure 3. Distribution of the 574 answers to Question 1 (top) and Question 2 (bottom)



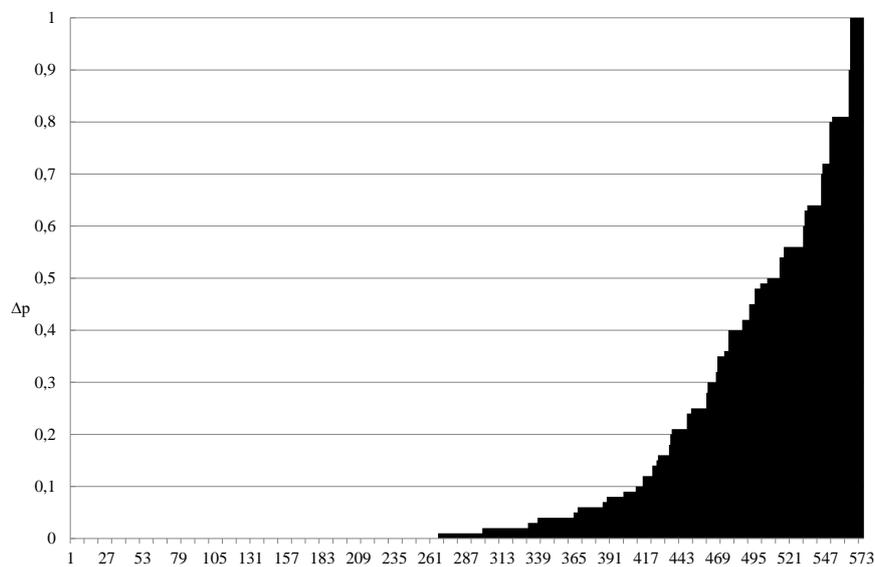
Source: authors

Based on the combined answers to Questions 1 and 2, only 10 of the respondents (1.7%) could be deemed HSR users exclusively linked to the HSR station. They gave scores of 10 to Question 1 and of 0 to Question 2, meaning that it was absolutely certain that they chose the Costa Daurada as their holiday destination because of Camp de Tarragona HSR Station and would not have chosen the destination if there had not been a nearby HSR station. Conversely, 159 respondents (27.7%) could be deemed HSR users absolutely loyal to the destination (Question 1 = 0; Question 2 = 10), who did not choose the Costa Daurada as their destination because of Camp de Tarragona HSR Station and would have travelled to the destination regardless of the existence of the station.

The individual increase in the probability of visiting the Costa Daurada due to the existence of Camp de Tarragona HSR Station appears in Figure 4, based on individual values obtained from Equation 2. The increase was zero for 266 passengers (46.3%), which included respondents who gave scores of 0 in reply to Question 1 and of 10 to Question 2 (159), those who gave scores of 0 to

Question 1 and anything other than 10 to Question 2 (27), and those who gave scores of 10 to Question 2 and anything other than 0 to Question 1 (80). By contrast, for 308 passengers (53.7%), the probability of choosing the Costa Daurada as a tourist destination increased due to the existence of Camp de Tarragona HSR Station. In the second group, the increase in probability ranged from 1% (0.01 in Figure 4) to 100% (1.00 in Figure 4). Nevertheless, a close analysis of Figure 4 shows that the increase in the probability of travellers who visited the destination was less than 10% in nearly half of those cases. By contrast, the increase in probability exceeded only 80% for 23 tourists.

Figure 4. Distribution of the 574 respondents according to individual increase in the probability of visiting the Costa Daurada due to the existence of Camp de Tarragona HSR Station



Source: authors

We also assessed the increase in the probability of visiting the destination attributable to the existence of the HSR station for the entire sample, and we have summarised the results in Table 3. Arguably, the influence of Camp de Tarragona HSR Station on destination choice (k -value)—in this case, the Costa Daurada—was moderate and accounted for 33.3%. By contrast, the background probability ($1 - c$) of the visit to the Costa Daurada irrespective of the existence of Camp de Tarragona HSR Station was exceptionally high (77.2%). In other words, more than three fourths of the passengers interviewed would almost certainly have chosen the same destination if there had not been an HSR station near it. We consider that such a high value linked strongly to two facts. First, more than 60% of HSR users interviewed stayed in private accommodations, whether their own or belonging to their friends or relatives. The availability of those accommodations at the destination, particularly those belonging to the travellers themselves, was a sufficient motive for visiting the Costa Daurada regardless of the existence of Camp de Tarragona HSR Station. Second, nearly 90% of

respondents had visited the destination on other occasions, although they had not always used Camp de Tarragona HSR Station. More than a third of the HSR users interviewed had not previously used the HSR service, which implied a change in their habitual mode of transport and the existence of various alternative ways of travelling to the Costa Daurada.

Lastly, the application of Equation 3 revealed that the increase in the probability (Δp) of visiting the Costa Daurada created by Camp de Tarragona HSR Station was 14.1% for the entire sample. In short, based on fractional responses, one in every seven HSR users surveyed visited the Costa Daurada because Camp de Tarragona HSR Station was nearby.

Table 3. Causal effect of the Camp de Tarragona HSR station on the choice of Costa Daurada as destination

Number of passengers (N)	574
Influence of the HSR station on the visit (k)	0.333
Background probability of the visit ($1 - c$)	0.772
Increase in probability of visiting the destination due to the HSR station (Δp)	0.141

Source: authors

However, despite that summary characterisation, HSR passengers travelling on holiday to central Costa Daurada are not homogeneous. The increased probability of visiting a destination due to the existence of a HSR station can extend to a variety of travellers and depend, among other factors, on their sociodemographic profiles and the specific characteristics of the trip in question. As such, we assessed the variability of that increased probability according to the previously mentioned sociodemographic and trip characteristics, the findings of which we present in Table 4.

Among significant differences, the increased probability of visiting the destination due to the existence of the HSR station was greater for travellers from more distant regions, including Madrid (16.6%) and parts of southern Spain (17.7%) such as Andalusia, Extremadura, and Castilla-La Mancha. That result could be explained because for farther origins, using HSR services implies more travel time saved than with alternative transport modes. That finding is of particular interest because, as Table 1 shows, more than a third of respondents were from Madrid. At the same time, that value dropped to 12% for tourists from Aragon, which was the second-most popular region of origin. However, the shorter distance to Costa Daurada facilitated the use of private cars as the primary transport mode.

The increased probability was nearly twice as high among first-time visitors to the destination. In that case, Δp was 23.9%; otherwise, it was only 12.9%. Camp de Tarragona HSR Station therefore seemed to provide a strong incentive to visit the destination for the first time. Even so, those new visitors represented only 11.3% of the sample (Saladié et al., 2016).

The results obtained followed a clear pattern when we analysed group size, which increased along with the value of increased probably, from 12.6% for unaccompanied tourists to 20.5% for groups of more than four people. HSR services seemed to facilitate group trips and overcome problems of limited space in private cars, especially for families with children. We found a greater increase in the probability of visiting the destination due to the presence of the HSR station among families travelling with children (19.8%) than among groups composed of adult friends or relatives (12.1%).

Concerning the mode of transport used to reach the final destination from Camp de Tarragona HSR Station, the tourists most influenced by the HSR travelled by taxi (17.7%). However, the most common situation at such a peripheral station was that HSR passengers were picked up and taken to their final destination by car, by either a friend or relative. In that case, the observed increase in probability was 12.9%.

Table 4. The increased probability of visiting the destination due to the HSR station on different segments of the travellers surveyed

Sex	Δp	Region of residence	Δp
Female	0.150	Catalonia	0.126
Male	0.130	Aragon	0.120
Age (in years)	Δp	Madrid	0.166
18–25	0.124	Navarra or Basque Country	0.113
26–40	0.177	Southern Spain	0.177
41–60	0.115	Level of education	Δp
>60	0.130	None	0.114
Group size	Δp	Primary	0.133
One	0.126	Secondary	0.174
Two	0.140	University	0.112
Three	0.152	Type of accommodation	Δp
Four	0.168	Hotel	0.191
More than four	0.205	Campsite	0.158
Party structure	Δp	House of friends or relatives	0.146
Adult travelling alone	0.126	Own accommodation	0.076
Family with children	0.198	Holiday rental	0.119
Adult with relatives	0.121	Location	Δp
Adult with friends	0.141	Salou	0.139
First visit to the destination?	Δp	Cambrils	0.147
Yes	0.239	City of Tarragona	0.160
No	0.129	La Pineda	0.200
Previous use of the HSR station? †		Elsewhere in Costa Daurada	0.121
Yes	0.131	Transfer from the HSR station	
No	0.125	Friends or relatives (by car)	0.129
Booking	Δp	Taxi	0.177
Travel agency	0.151	Bus	0.143
Book by themselves	0.141		

Key: †Only repeat tourists

Source: authors

As expected, the least increase in probability was associated with tourists who had second homes in the area (7.6%), whereas the greatest related to those who stayed in hotels. Accordingly, it was unsurprising that the lowest values emerged regarding the least touristic area at the destination—the ‘rest of the Costa Daurada’ (12.1%)—which hosts fewer HSR users accommodated in hotels. By contrast, locations with the greatest presence of hotels (i.e., Salou, Cambrils, La Pineda, and Tarragona), which were also the chief destinations, produced the highest scores.

A closer look at the results allowed responses to the different questions posed in the survey to be combined in order to find the passenger profiles associated with the greatest and least increases in the probability of visiting the Costa Daurada due to the existence of Camp de Tarragona HSR Station. The combination of responses was based on answers that helped to define the chief sociodemographic and trip characteristics: the region of origin of the tourists, their age groups (e.g., 26–40 and 41–60 years old), the group structure (e.g., unaccompanied tourists, tourists with adult relatives, and families with children), distinction between first-time or repeat visitors, type of accommodation (e.g., own accommodation and hotel), location at the destination, and transfer from the HSR station (e.g., with friends or relatives by car or taxi). The 10 highest and lowest values resulting from combining pairs of sociodemographic and trip characteristics appear in Tables 5 and 6, respectively. We have discarded combinations representing less than 3% of the sample.

As Table 5 reveals, seven of the 10 greatest values were associated with increases of more than 25% in the probability of visiting the destination because of the presence of the HSR station. The most frequent characteristics in the different combinations were first-time visitors (5 times), travellers in families with children (4 times), and those in the 26–40-year-old age group (4 times). Similarly, the highest value corresponded to a HSR passenger on his or her first visit to the destination and to a party formed by a family with children ($\Delta p = 31.5\%$), which was more than double the score than for the whole sample. Nevertheless, only 4.2% of passengers were included in the combination of those pairs of characteristics. In fact, only families with children accommodated in a hotel (i.e., the tenth item in Table 5) represented more than 10% of the sample. That low level of representation was expected because some individual attributes with the greatest Δp values, including first-time visitors (11.3%), did not have a major presence in the sample as a whole.

At the other end of the scale are segments that exhibited the least increase in the probability of visiting the Costa Daurada attributable to the existence of Camp de Tarragona HSR Station (Table 6). In the top 10 pairings were individual tourists staying in their own accommodations and adult relatives travelling within a party structure, for which Δp was only 1.9%. All 10 combinations produced Δp values of less than 10%. Notably, the presence of tourists staying in their own accommodations appeared in six of the 10 segments. Moreover, it is significant that passengers in the 41–60-year-old age group appeared in four of the combinations. Regarding the respective

weights of those segments within the whole sample, four represented more than 10% of the sample, and two (i.e., own accommodation, repeat visitor and 41-60 years old, transfer with friends or relatives) represented 19-20%.

Table 5. Profiles with the greatest increase in probability

<i>Segment</i>	Δp	% of the sample
Family with children, first visit to the destination	0.315	4.2%
Family with children, 26–40 years old	0.278	6.3%
First visit to the destination, hotel accommodation	0.273	6.6%
First visit to the destination, 26–40 years old	0.267	4.5%
Transfer by taxi, 26–40 years old	0.267	5.9%
First visit to the destination, transfer by taxi	0.264	3.5%
Family with children, travelling from Madrid	0.260	7.0%
First visit to the destination, travelling from Madrid	0.243	5.4%
Stay in the city of Tarragona, 26–40 years old	0.233	5.6%
Family with children, hotel accommodation	0.231	11.0%

Source: authors

Table 6. Profiles with the lowest increase in probability

<i>Segment</i>	Δp	% of the sample
Own accommodation, with adult relatives	0.019	3.3%
Own accommodation, 41–60 years old	0.047	6.4%
Own accommodation, staying elsewhere in Costa Daurada	0.055	7.0%
With adult relatives, 41–60 years old	0.064	6.1%
Travelling from Aragon, 41–60 years old	0.073	7.1%
Own accommodation, repeat visitor	0.075	19.3%
Own accommodation, travelling alone	0.080	12.5%
41–60 years old, transfer with friends or relatives	0.083	20.6%
Own accommodation, transfer with friends or relatives	0.084	14.9%
Travelling from Aragon, staying elsewhere in Costa Daurada	0.094	7.7%

Source: authors

7 Conclusions

The first outcome of the research was the validation among HSR users of a causal method for quantifying the effects of HSR services on destination choice. The probabilistic method applied made it possible to measure the contribution of the presence of Camp de Tarragona HSR Station on the choice of a tourist destination (i.e., the Costa Daurada) by each individual HSR user travelling on holiday to the destination (i.e., fractional contribution). That method allowed us to obtain more refined results than a binary classification would have.

Our first conclusion from the data obtained is that the influence of the existence of the HSR station was moderate. Our results show a high background probability that HSR passengers travelling by

train would have gone to the same destination even if the HSR station had not existed (77.2%). By contrast, the increased probability of their visit to the Costa Daurada attributable to the existence of Camp de Tarragona HSR Station was only 14.1%. If we add that tourists arriving by HSR formed 4% of all the visits to the Costa Daurada, then the existence of the HSR station generated a low effect in terms of attracting new tourists to the destination.

Second, evidence provided by the data demonstrates the existence of significant differences between visitors according to their different travel behaviour and sociodemographic characteristics. Results support the argument that tourists travelling to a mature coastal destination by HSR are a very heterogeneous market. One of the most outstanding differences observed was between first-time (Δp 23.9%) and repeat tourists (Δp 12.9%). Other key variables were region of origin—with tourists from Madrid (Δp 16.6%) and southern Spain (Δp 17.7%) as the most influenced—the type of group travelling (with families with children being the key profile, Δp 19.8%, and the high presence in pairs of factors contributing to the greatest increase in probability), the type of accommodation used (tourists staying in hotels were most influenced, Δp 19.1%), and length of stay (with long stays being most influenced). Findings also help to reinforce the stream of academic evidence from cases of large cities that HSR positively affect the attractiveness of destinations for tourists (Pagliara et al., 2015). Although those positive effects are only moderate because they generate additional tourist flows (Coronado et al., 2013; Masson & Petiot, 2009) changes in the mode of transportation used by visitors to reach the final destination can also be identified.

Our paper adds new evidence to currently scarce, but growing literature on the effects of HSR on destination choice (Delaplace et al., 2014; Pagliara et al., 2015) and thereby opens the door to further research on the topic. Once validated, the method could allow similar surveys based on the approach. Our study could be replicated at other HSR stations and in other territorial contexts. In the case of the Costa Daurada, the peripheral situation of the station, the distance (20 km) to the main coastal destinations, and the lack of effective public transport services have determined a special territorial context. To allow comparative studies, it would be interesting to conduct similar research in either of the Spanish HSR stations close to a coastal destination (i.e., Alicante or Málaga), since both are situated in the city centre.

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