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Research note

Spatial heterogeneity in Spain for senior travel behavior

Nieves Losada[a], Elisa Alén[b,*], Tomás R. Cotos-Yáñez[b], Trinidad Domínguez[b]

[a] University of Tras-os-Montes e Alto Douro, Centre for Transdisciplinary Development Studies (CETRAD), Edifício da ECHS - Polo II, Quinta de Prados, 5001-801, Vila Real, Portugal

[b] University of Vigo, Faculty of Business Sciences and Tourism, Campus Universitario, s/n, 32.004, Ourense, Spain

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ABSTRACT

Travel patterns are becoming more differentiated, influenced by new variables resulting from changes in lifestyle. The relevance of the senior segment for this industry, with the continuous aging population and their economic status, made this segment a very attractive group for the sector, and even more so in a country that is characterized by its aging, such as Spain. Spatial effects are considered a key element to understand this process, but there are only a few studies focusing on cross-cultural influences and the neighborhood context. For this purpose, the technique of geographically weighted principal component analysis (GWPCA) is applied in a novel way for the sector, showing different behavior patterns according to area of origin. The GWPCA is a localized version of the principal component analysis (PCA) used when there is a certain spatial heterogeneity in the structure of a multivariate data set. The results confirmed that GWPCA is an effective statistical methodology to research spatial heterogeneity for travel behavior, with clearly differentiated scenarios for the north, center and south of Spain, where the most determining factors in each case were hygiene and cleanliness, medical coverage and transport facilities.

1. Introduction

The application of the geographically weighted principal component analysis (GWPCA) technique is used in this paper to identify different spatial areas in Spain according to senior behavior patterns. The GWPCA can be defined as a local principal component analysis (PCA) in each location (Demsar, Harris, Brunsdon, Fotheringham, & McLoone, 2013; Harris, Brunsdon, & Charlton, 2011). The PCA is a statistical method for multivariate analysis used in different areas of physical science (Davis, 2002; Harris et al., 2011; Jeffers, 1967; Legendre and Legendre, 1998), human science (Griffith & Amrhein, 1997) and social science (Lloyd, 2010; Wu, Cheng, Chen, Hammel, & Wu, 2014). The PCA is a multidimensional statistical technique, transforming a set of original variables (usually a large number) into a new set of variables, the principal components (PCs), which are uncorrelated, grouping the majority of the variance of the data set into a few PCs. This reduction in the number of variables potentially can provide a better understanding of the new artificial quantities (Jolliffe, 2014). It is necessary to decompose the covariance matrix to find the principal components. The components in geographical settings depend on location, and an extension of the PCA to geographical data is necessary to account for this spatial heterogeneity. While PCA analysis can provide information regarding global internal structure, it fails to consider that the covariance structure of the data can change spatially. In essence, GWPCA performs a local PCA analysis by considering a neighborhood around each spatial feature. The concept of geographical weighting, introduced by Fotheringham, Brunsdon, and Charlton (2002), attempts to account for the spatial variability existing in certain geographical contexts that are not captured by the global PCA or traditional regression models. The idea is similar to that of geographically weighted regression (GWR) analysis compared to a standard regression (Fotheringham et al., 2002), determining the standard deviation of each local eigenvalue in a rank distribution of standard deviations obtained by applying GWPCA to each randomized data set (Roca-Pardiñas, Ordóñez, Cotos-Yáñez, & Pérez-Álvarez, 2017).

Compared with the PCA, GWPCA is appropriate for exploring the impacts of geographical variation on socioeconomic patterns and uncovering the spatial-dynamic features of geographical processes (Demsar et al., 2013). This technique has been applied to study social structures (Harris et al., 2011), regional economic development patterns (Li, Cheng, & Wu, 2016), soil characteristics (Fernández et al., 2016; Kumar, Lal, & Lloyd, 2012; Roca-Pardiñas et al., 2017), freshwater chemistry data (Harris et al., 2011) and multivariate population characteristics (Lloyd, 2010), among others. However, as far as we know, there are no GWPCA applications in the tourism sector.

The aim of this study is to discover if there are geographically

* Corresponding author.
E-mail addresses: nlosada@utad.pt (N. Losada), alen@uvigo.es (E. Alén), cotos@uvigo.es (T.R. Cotos-Yáñez), trinidad@uvigo.es (T. Domínguez).

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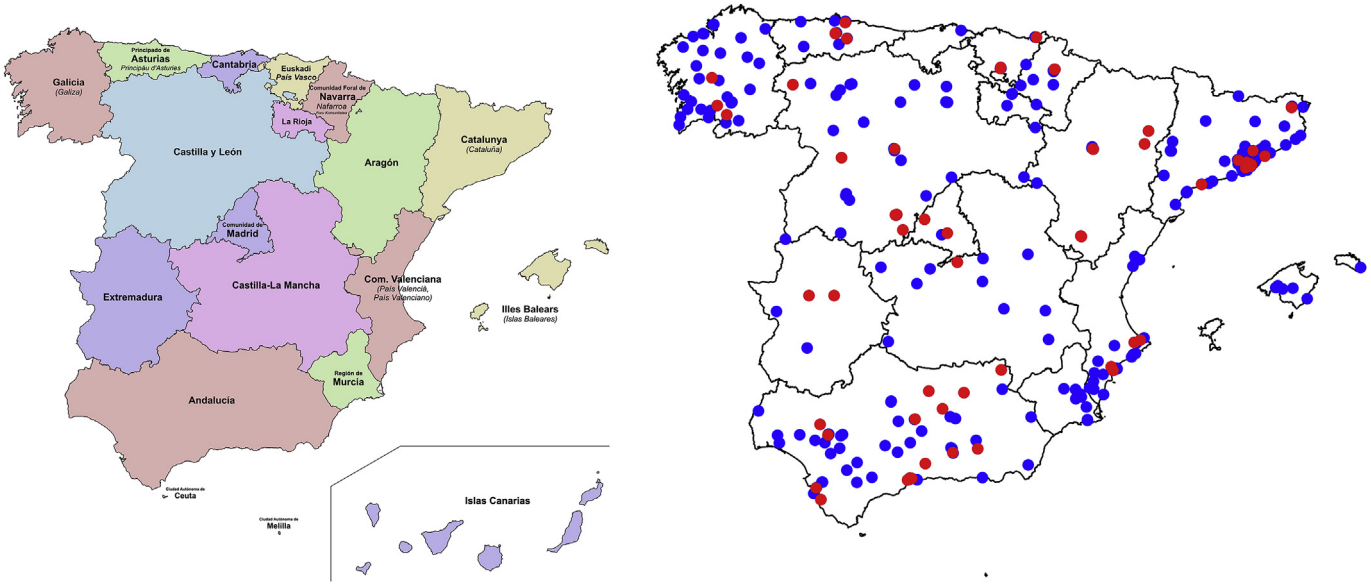

Fig. 1. Map of Autonomous Communities in Spain(left)and geographical coordinates of the sampling points in spain(right).

heterogeneous travel behavior patterns among Spanish seniors given the cultural, economic and social diversity that characterizes the country. Moreover, the demographic change in Europe will be one of the external factors that will shape tourism demand and the development of the sector in the medium and long term, turning senior tourism into a growing market segment (OECD, 2014). In fact, the World Tourism Organization estimates that the population of seniors 60 years old and over will take more than 2 billion international trips by 2050, compared to 593 million trips in 1999 (Patterson, 2006). On the other hand, the culture associated with an individual has been recognized as one of the factors that influences attitudes, beliefs and behaviors to a major extent (Ozdemir & Yolal, 2017}). Thus, cross-cultural analysis is particularly useful in deciding which elements of a marketing program can be standardized across different locations and which should be more specific (Engel, Blackwell, & Miniard, 2001). Therefore, in a globalized and multicultural world, such as the present one, the cross-cultural approach has been shown to be a powerful marketing tool, considering the origin of the individual as a variable in the segmentation of tourism markets (Lee & Sparks, 2007; Li, 2014; Ozdemir & Yolal, 2017).

2. Data and method

2.1. Sampling survey

The questionnaire for the survey was based on a literature review about senior tourism. It consists of questions concerning:

1. Sociodemographic data: age, number of family members, income and self-perceived factors (health, economic status, and amount of time available to travel) (Chen, 2009b; Crompton, 1979).
2. Travel data: planning and length of the trip; attraction attributes at the destination (11 items),
   a. hygiene and cleanliness (attr.1) (Alén, Losada, & de Carlos, 2017; Chen & Gassner, 2012; Jang & Wu, 2006; Wu, 2003),
   b. security (attr.2) (Chen, 2009b; Chen & Gassner, 2012; Jang & Wu, 2006; Wu, 2003),
   c. climate (attr.3) (Alén et al., 2017; Baloglu & Shoemaker, 2001; Norman, Daniels, Mcguire, & Norman, 2001; Prayag, 2012),
   d. travel cost (attr.4) (Alén et al., 2017; Baloglu & Shoemaker, 2001; Wu, 2003),
   e. events and festivals (attr.5) (Alén et al., 2017; Chen, 2009b),
   f. transport facilities (attr.6) (Lee & King, 2016; Prayag, 2012),
   g. shopping areas (attr.7) (Baloglu & Shoemaker, 2001; Prayag, 2012; Sangpikul, 2008),
   h. medical coverage (attr.8) (Huang & Tsai, 2003),
   i. places of historical-artistic interest (attr.9) (Alén et al., 2017; Baloglu & Shoemaker, 2001; Chen & Gassner, 2012; Huang & Tsai, 2003; Jang & Wu, 2006; Lee & King, 2016; Norman et al., 2001; Prayag, 2012; Sangpikul, 2008; Wu, 2003),
   j. attractions and natural landscapes (attr.10) (Alén et al., 2017; Jang & Wu, 2006; Norman et al., 2001; Prayag, 2012; Wu, 2003), and
   k. appropriate distance (attr.11)(Huang & Tsai, 2003).

Self-perceived factors and the destination's attraction attributes were measured using a 5-point Likert scale. A nominal scale was used to classify family income per year: less than 8000€, 8000–12,000€, 12,001–16,000€, 16,001–20,000€, 20,001–24,000€ and more than 24,000€. The remainder of the variables used were numerical.

Data were obtained through telephone interviews with residents of Spain over the age of 55. The cutoff age was established for two reasons. First, it is the average age used in studies dealing with seniors and tourism. Second, the baby boomer generation in Spain today approximately at that age (55 years old) and, as argued by Cooper, Fletcher, Fyall, and Wanhill (2007), Prideaux, Wei, and Ruys (2001) and Ramos (2005), this is expected to introduce profound changes in the composition of the tourist market.

Spain will be one of the oldest countries in the world, reaching a median age of 50 years in 2050 (United Nations, 2013). Wallace (2000) suggests an aging society is much less homogeneous than a society with a high fertility rate. Additionally, historical evolution, geographical factors and unequal distribution of resources in Spain have given rise to a very heterogeneous country, with great territorial imbalances present in its social, economic and cultural spheres. The country is divided into 17 autonomous communities (see Fig. 1). There are large asymmetries between the seniors in terms of social benefits (retirement pensions and health (Abellán, Ayala, & Pujol, 2017)) depending on the GDP per capita of each autonomous community. In 2012, those over 55 years old accounted for 30.7% of the Spanish population, or 12,739,453 people (INE, 2013); 44.19% of these made at least one trip to an overnight destination within that same year (IET, 2013).

A probabilistic two-stage sampling procedure was chosen to obtain a sample representative for the national level. In a first stage, the target