

Article

Using the Network and MCA on Tourist Attractions. The Case of Aeolian Islands, Italy

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Abstract: This study highlights the preferences and motivations of tourists for the choice of destinations to visit. Natural, cultural, gastronomic attractions, places of consumption, and identity/immaterial motivations are examined through social network analysis and validated through the multiple correspondence analysis (MCA). The study explores the relational variables that can explain the attractiveness of the places and the propensity to visit them. To identify the visitor profiles and the reasons behind their choices, a sample survey was carried out in Lipari, in the Aeolian Islands, interviewing tourists, residents, and people present on the island for work reasons. From the results obtained, profiles emerged with very different characteristics. They vary among those who are attentive to the identity and sustainability of the territory and appreciate the beauty of the sea to others who are attracted mainly for places of consumption and gastronomy, and finally, to people who are indifferent to the attractiveness of the place. This study contributes to the knowledge of the tourist understanding of fragile places with a strong tourist attraction and provides indications for better use of the resources present, oriented towards eco-sustainable hospitality systems and the environment. The study discusses the implications of its findings for future research and provides insights for planning tourism services.

Keywords: Destination Islands; Italy; network analysis; MCA

1. Introduction

Tourism is an important source of revenues for many islands and countries of the world. Tourism is both a chance and a challenge in the islands. The development of the islands is a dynamic and competitive tourism business that requires the ability to constantly adapt to tourists' changing needs and wants and also that meet the resident's satisfaction, enjoyment, and well-being while preserving the socio-economic environment for sustainable development. Tourism is one of the activities that have contributed most to transforming the Mediterranean coastline and islands.

It has been shown that many small islands in developing states face special disadvantages associated with being minor in size, insular, remote, and prone to natural disasters [1], while having, at the same time, to preserve the uniqueness of the destination [2]. Many authors have examined the development of island tourism, particularly the relationship between hosting communities and tourists [3,4]. Furthermore, tourism on small islands has led to increases in income and well-being, so residents are available to engage and support tourism [5]. Islands are a top destination for millions of tourists, drawing physically isolated communities into the global market, in addition to having to deal with the hidden costs and benefits of this movement [6,7]. Consequently, two main aspects must be considered. First, that small islands are unique for tourists [8], who are attracted for the natural heritage of its geographical beauty, from the richness of the cultural heritage, and from enogastronomy.

The second aspect is connected to the problems of vulnerability and fragility that exist on the small islands. They are “paradises but also gulags” [9] (p. 248); that is, there is a limitation of work, opportunity, and also space. The economy of small islands with the greatest profitability is tourism. In this regard, there is an increase in job opportunity, which is considerable, bringing in both local income and foreign exchange [10,11]. With regard to the contribution to GDP, small islands show a high level of dependence on tourism. Their returns on an economic and social level and in the arrival of foreign tourists, vary considerably [12]. The distance and isolation of small islands lead to challenges for trade. At the same time, important cultural and natural resources, such as the maritime environment, lead to strong tourism resources but also to climate vulnerability [13].

Information on the characteristics and preferences of visitors with regards to the attractions in a tourist destination, such as islands, is an important key to planning the economic and social development of a specific area.

With the research, we aim to contribute to the field by augmenting the catalogue of tourism destination network studies and presenting the results of an investigation conducted in the Aeolian Islands, a renowned Italian destination. The research intends to explore the relational variables that can explain the attractiveness of places and the propensity of people to their use. The goal of the methodology used in this study is to determine what are, for visitors, the most significant characteristics in the action of choosing one attraction offered by the island over another. In particular, the study applies a network analysis, examining the tourist attractions of Lipari, an island belonging to the Aeolian Islands (Italy). Otherwise, the main qualitative variables, as a whole, have been observed by multiple correspondence analysis (MCA), including the profile of tourists depending on their choice of attractions at the destination.

2. Study Area

The study took place in the Aeolian Islands, which are famous for sea-attraction travel. The tourism of the Aeolian Islands and its characteristics have been the subject of several studies in the literature. The archipelagos are able to offer tourists a diverse range of experiences [5,9]. The Aeolian archipelago, located in the south of Italy, consists of seven main islands, with a total area of 117 km²: Alicudi Filicudi, Stromboli, Panarea, Vulcano, Lipari, and Salina. The key feature is that the territory of the Aeolian Islands is strongly characterised by intense volcanic activity that has affected environmental components and the evolution of morphological, social, and economic life throughout history [14]. The Aeolian archipelago is recognised as a UNESCO Heritage Site (2000).

Considering the territory and the attractions of Lipari that have been investigated, some represent tangible components, such as geographic attractions, urban structure, real estate infrastructure (communication routes, networks, public services), the productive fabric, and tourist accommodation (accommodation, restaurants, bars, points of sale, etc.). Other attractions are related to the cultural heritage and the historic-artistic values of the territory (places of historical interest: the Archaeological Museum, the cathedral, the main churches, etc.). As for the intangible components, among these factors some have been grouped according to the perceptions and the main motivations that are at the base of the tourist attractions. For example, the places of the “movida” were considered, which are well-known and loved areas of the island, capable of attracting visitors, guiding choices and attitudes in the use of the place, and which can be conscious/rational and emotional/spontaneous. A total of 23 tourist attractions were identified (Figure 1), taking into account both the tangible components present in the territory and the intangible ones in terms of cultural and social attractiveness offered and perceived in the territory (the system of civil and social values, the competences of the local production system, the quality of human resources).

The World Heritage Site Management Plan emphasises the exploitation of natural resources as important by linking them to related activities, improving the image of local products, and strengthening their quality and guarantee. The charming coast of sand, the predominantly cultivated fields of wine grapes and forests, the unique natural features, the typical Mediterranean

climate and human settlements, all these components create a highly distinctive mixture of natural and touristic landscapes. The islands are part of the Province of Messina of the region of Sicily. According to the Region Sicily Bureau, Table 1 shows how the Aeolian Islands have known tourism development for about twenty years. Every year the tourist season begins in June and ends at the end of September depending on the climatic and geographical characteristics.

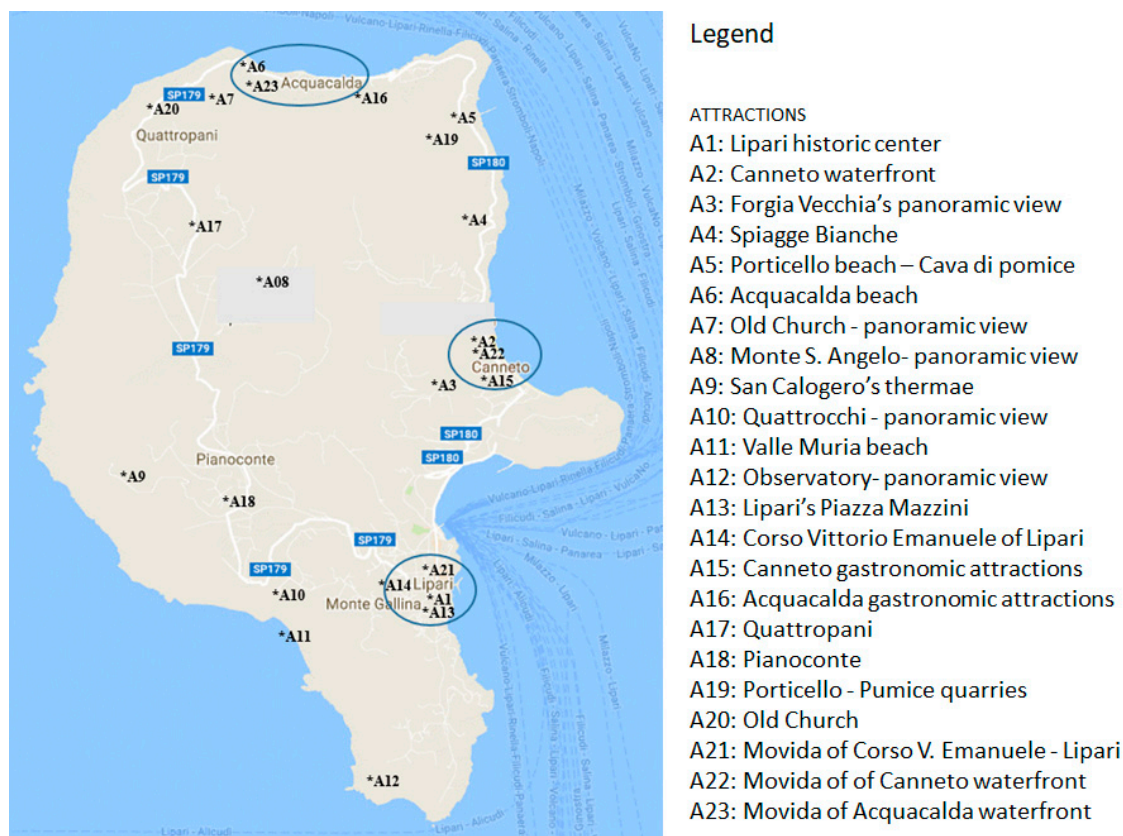


Figure 1. The 23 attractions of Lipari. Source: The authors.

Table 1. Data on tourist arrivals and presences.

	Arrivals				Presences			
	International	Domestic	Total	Index n.	International	Domestic	Total	Index n.
2000	34,846	57,116	91,962	100.0	124,738	290,687	415,425	100.0
2011	45,707	72,094	117,801	128.1	145,202	306,190	451,392	108.6
2012	49,200	71,572	120,772	131.3	154,502	292,387	446,889	107.5
2014	66,456	76,996	143,452	155.9	206,994	297,724	504,718	121.4
2015	65,686	75,718	141,404	153.7	206,824	293,278	500,102	120.3
2016	68,170	64,346	132,516	144.1	210,596	232,120	442,716	106.5

Source: Elaboration by the Authors, data Italian National Institute of Statistics, 2018.

3. Materials and Methods

3.1. Network Analysis and MCA in the Tourism

A tourist destination is a real and virtual space where the operators can meet, exchange information and experiences, and develop common projects. It is also where there are many business and non-business networks that direct the destination's development [15]. The destination itself is a combination of various components of tourism products and services, offering an integrated

experience to visitors [16,17]. The network could be as a destination [18,19]. Network theory has found application in many studies on tourism: collaboration between scholars and operators who deal with research on tourism; innovation and interdisciplinary knowledge networks on tourism studies; destination marketing and behavioural models; tourist flows and movements in destination and related political and social repercussions in the areas examined [20–28]. Networking can, in many cases, be a strategy for companies that want to gain a competitive advantage in the specific context of a destination [29,30]. Among the researches on network analysis in tourist literature, the attractiveness of the places visited in relation to identity and value motivations has been little investigated. Only a few researchers seem to have examined attraction networks as informed by tourists' free choice, intra-destination movements [31,32]. In these cases the correlation between the tourist flows and the network connections between the destinations is highlighted. The study of networks assumes that individuals or organizations do not act in isolation and that the pattern of relationships developed with other actors is strongly influenced by their behavior [33]. In the network, the tourists/actors of the destination are connected to the places visited/attractions, which they choose based on their behaviour and their free choice. Tourist motivation can be considered the primary driver if we want to interpret their behavior [34,35]. In addition, people travel to meet their needs for well-being, knowledge and escape, as well as for increasing friendships, experiences and social relationships [36,37]. Tourist attitude is complex and generally multifaceted and has also been categorized into attraction and social motivations [38]. It is important to analyze the attraction-to-attraction networks as indicators of potential changes in the visitor's choices, this because the tourist flows are important for delineating the networks of attractions towards the destinations.

In particular, social network analysis allows for the examination of the relational aspects and network dynamics that take place in a land endowed with tourist attractions. Moreover, it describes the structure of a system as a set of interconnected elements (nodes) that exist through a series of relationships (or links) [29]. In this case, the elements are the visitors to the destinations who travel to multiple attraction places. Moreover, many visitors and multiple attractions exist with different characteristics and dimensions in a dynamic and complex context.

Correspondence analysis is a technique which can handle problems of this complexity [39,40]. Correspondence analysis is a technique which can explore multiple categorical variables where other multi-attribute analytical methods cannot. An MCA was used to consider the main qualitative variables as a whole, including profile membership from the previous analysis. It is useful to apply MCA to identify and examine the profiles of tourists in relation to the types of preferred attractions. The MCA technique is used to detect and represent underlying structures in a dataset made-up of qualitative/quantitative variables. Many researchers have used MCA in tourism for different purposes. MCA has mainly been used to identify and examine the profiles of tourists in relation to the many types of favorite attractions [41]. Moreover, MCA allows the use of multidimensional data to spatially map each of the attributes [42–45].

3.2. Data Collection

To collect data, a list was prepared of tourist attractions in Lipari, using technicians, officials, and opinion leaders of the territory, identifying physical places and intangible places that contain cultural, social, and psychological aspects. The study used a semi-structured questionnaire with free and/or preformulated answers to survey 590 people available to the interview and intercepted in various tourist locations on the island of Lipari, including the port, some restaurants and hotels, and meeting places in the city centre. Some interviews were conducted on the occasion of cultural events. Different types of subjects who benefit from the island's attractions were interviewed and available to the interview: travellers (both free and independent and in organised groups), people present on the island for work reasons, and residents.

The interviewees were asked to indicate the places/attractions they had visited or intended to visit, and were also asked to indicate, on the basis of a grid of 10 questions we have worked out, the

motivations that guided their preferences. The questions asked (Table 2) take into account the main types of tourist attractions on the island. The questionnaire also includes questions that identify the socio-economic characteristics of the interviewees (gender, school level, employment, and income). In particular, the questions asked of the respondents their views on:

- the natural attractions from the point of view of the beauty of the sea and the landscape (D3) and from the point of view of the identity of the territory (D2)
- cultural attractions such as the museum, the Cathedral, the Castle, the historic centre, the acropolis (D5)
- gastronomic attractions related to the vast and varied gastronomic heritage (D1), experiences and experimentation of local cuisine (D6), perception towards food security (D8)
- attractions that involved places of consumption (D4), restaurants, bars, wine bars, ice cream parlours, agritourism, etc.
- the intangible attractions concern:
 - “movida” and “physical” sharing with others (walking, eating together, playing sports together, etc.) linked to interpersonal relationship (D9)
 - the experience of experiences on holidays (D10), how to tell friends and relatives about the experience, share photos and more on social network, etc.
 - finally, a question concerned habits and lifestyles “Customs and ways of life” (D7)

Face-to-face interviews were conducted between March and July 2017 in particularly crowded places such as ports, bus terminals, fairs, and main roads, where a sample with uneven characteristics could be encountered. The valid and controlled questionnaires that were subsequently submitted to in-depth analysis and processing numbered 573.

The descriptive analysis highlighted the main features at first, then we used a network application that was validated by the MCA. Thanks to the UCINET 6 and SPSS 20 program, two databases have been created. In particular, the former made it possible to create a network and study connections and social networks [46].

Table 2. The main choices of tourist attractions.

D1	Varied gastronomy heritage
D2	Identity of territory
D3	Scenic beauty of sea and landscape
D4	Places of consumption
D5	Places of historical and cultural interest
D6	Experiencing local cuisine
D7	Customs and ways of life
D8	Health food
D9	Interpersonal Relationship
D10	Experiences on holidays

Source: The authors.

3.3. Approach

The first step was to process the data collected, considering a first phase of descriptive analysis to evaluate the main features and then the analysis of the social network and the analysis of multiple correspondence (MCA). From an operative point of view, the links have been found using incidence and adjacency matrices (generated by the matrix incidence), in which each relation is indicated with dichotomous values. In fact, once the data were collected, they were organised in the Affiliation matrix, a dichotomous matrix in which the lines indicate the actors and the columns the places of attraction. The matrix is formally indicated as:

$$A = \{a_{ij}\}$$

where $a_{ij} = 1$ if the actor lines i “has been attracted to and has visited the place” indicated in column j , or $a_{ij} = 0$ in the opposite case.

Two incidence matrices have been constructed on the basis of a questionnaire constructed ad hoc: A first matrix to obtain information about the places visited (573 rows \times 23 attractions), in which the rows represent the individual respondents and the columns tourist attractions.

The questionnaire was built to investigate the reasons for the tourism choice, from which asked the interviewees 10 questions, creating a second incidence matrix of 573 \times 10.

The next step was to transform the incidence matrices into adjacency matrices (23 \times 23 and 10 \times 10) to examine the network ratios based on the choice of places to visit and, in particular, on the motivations of these choices. For data processing, the UCINET 6.0 program ver. 6.631 was used, while for the graphic representation, it was NETDRAW ver.2.161.

To delineate the sample, descriptive analysis was used. Of the totality of the variables, both the absolute and the relative frequencies have been calculated.

To obtain a common overview on the links between the variables, the data obtained have been studied through multivariate statistical techniques. Exploring the relationships between the variables, we moved on to perform the MCA to evaluate the associations between the different categories of variables examined.

As for the indicators to examine the network analysis, some network cohesion measures were elaborated, in particular density that represents one of the main indicators of the degree of cohesion of a network and centrality, which measures how much a node is an important player in the network. The centrality indicators used in this study are: degree, close, and betweenness. After examining the network features, we wanted to deepen the characteristics and profiles of tourists in relation to the reasons stated for the choice and attractiveness of the places visited through the MCA. MCA is used to analyse observations described by a set of variables, coded as binary variables [40,47–51]. Through a representation, we defined some profiles for travellers in the Aeolian Islands (residents and non-residents), who have seen the attractions of the islands.

Categorical dependent variables can be evaluated with the MCA. We used the MCA to explore patterns of tourist behaviour and to identify visitor preferences. Operationally the set of variables have been coded with a Likert scale (1 = strongly agree, 6 = strongly disagree) as binary variables where the positive responses (very–very much) were considered with the number 1 and the negative ones (nothing–little) were coded with the number 2.

With MCA attribute factor scores assigned to each observation [52,53]. MCA is obtained by using a standard correspondence analysis on an indicator matrix (X). This is a $J \times M$ matrix where J_k is the vector of the levels for each K nominal variable (with $\sum J_k = J$), and M is the number of observations. Performing MCA on X will provide two sets of factor scores. These factor scores are, in general, scaled such that their variance is equal to their corresponding eigenvalue. The distances between row with row and column with column indicate proximity or distance of the variables. In the first case, proximity means that the variables observed are similar and tend to present themselves together [54]. Through representation in a low-dimensional space—planned on the basis of components—we aimed to define some profiles for island’s travellers.

MCA is realised through starting information represented by the following matrix $x = J_k M$ where J_k represents the vector of the levels J that can assume the variable for each k variable categorial ($k = 6$) adding 4 additional variables (gender, age, level of education, and why is it on the interview site). The number of observations was equal to $M = 573$.

This analysis has identified some variables to distinguish the main characteristics that most influence the decision making of visitors that have chosen places to visit.

4. Results

4.1. Sample Profile

With regard to the socio-economic characteristics of the sampling survey, the following categories have been calculated: gender, age group, education, number of family members, profession, and annual income. Table 3 shows descriptive statistics for respondents included in our survey. The consumers interviewed (Table 3) have a medium–high cultural level. Forty-nine point seven percent of the sample has a high school diploma and 35.1% have a degree. A slight majority are men (50.3%). The age classes see a prevalence of the 26–42 age group (30.7%) and 43–55 years (27.8%), followed by 18–25 years (25.1%), with the remaining 16.4% of the interviewees aged over 55 years. The most frequent number of family members is four (34%). They have a mainly low average annual income (from 15,000 to 30,000 euros/year). There are 59.3% of residents, and 40.7% non-residents (of which 30% are leisure tourists).

Table 3. Socio-economic characteristics of the respondents.

	n.	%		n.	%
Gender			Level of education		
Female	285	49.7	Elementary school	68	11.9
Male	288	50.3	Secondary school	304	53.0
			Degree	201	35.1
Age			Annual income (euro)		
18–25	144	25.1	<15,000	77	13.4
26–42	176	30.7	15,000–30,000	301	52.6
43–55	159	27.8	30,000–50,000	160	28.0
>55	94	16.4	>50,000	34	6.0
Profession			Household unit		
Worker	440	76.8	Single	26	4.52
Pensioner	52	9.0	2 members	74	12.9
Unemployed	22	3.9	3 members	140	24.5
Student	34	6.0	4 members	270	47.1
Other	25	4.3	>5 members	63	10.9

Source: The authors.

The first network (Figure 2) was created to examine the 23 tourist attractions. The relatively small size of the island determines a great mobility of visitors, in particular almost all go to some well-known locations and this leads to an extremely interconnected network. Following the questions asked to the interviewees (Table 2), a network was elaborated (Figure 3). For a precise analysis of the network, we have elaborated the density, the distance, and the centrality (degree, close, and between). The density index is one of the main descriptive statistics and is an indicator of the degree of network cohesion. It compares the existing bonds and has a range of variation from 0 to 1. The closer you get to the maximum value, the more cohesive the network is; in our case, it is equal to 0.695. This means that the network is cohesive, i.e., they are present just under 70% of connections. The standard deviation is 0.4604.

For an analysis of the cohesion level of the network, the density, distance, and centrality were elaborated (Table 4). For centrality measures, the degree, close, and between indices were considered.

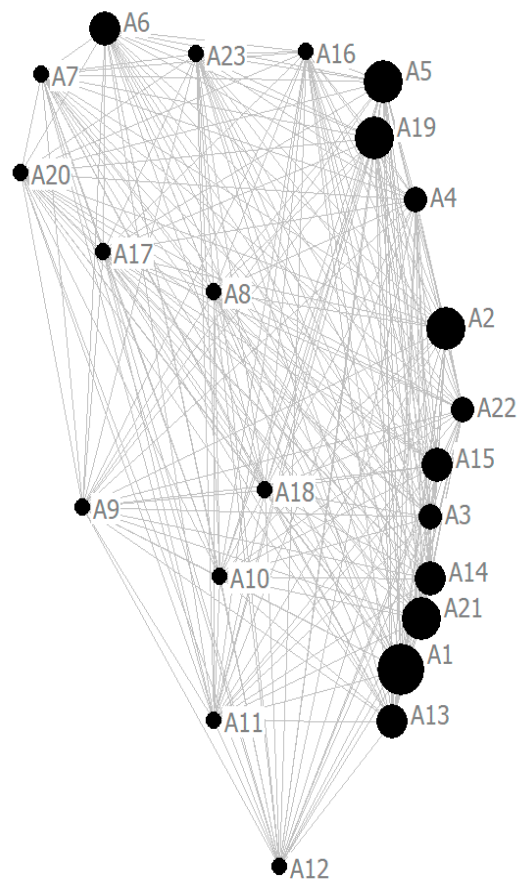


Figure 2. Tourist attractions network of Lipari. Notes: Each node is positioned based on the geographical location of the different tourist attractions. The size of the nodes depends on the number of visitors. Source: The authors.

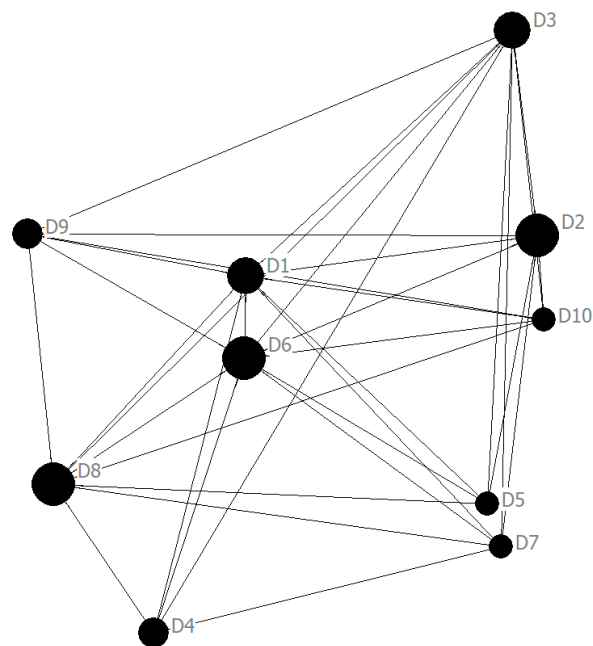


Figure 3. Tourist attraction network of Lipari. Note: The size of the nodes depends on the number of consents registered by each question. Source: The authors.

Table 4. Density/Standard Deviation and Geodesic Distance.

Densities and Standard Deviation	
Density (matrix average)	69.5%
Standard deviation	0.4604
Geodesic distance	
Average distance (among reachable pairs)	1.063
Distance-based cohesion (Compactness)	0.517
Distance-weighted fragmentation (Breadth)	0.483

Source: The authors.

The density represents one of the main descriptive statistics and indicates the degree of cohesion of the network. The average density of the network is equal to 0.6951 and, since the index varies from 0 to 1, this is a good level of network cohesion; it means that 69.5% of all possible links are present. The density value is confirmed by the value of the standard deviation equal to 0.4604, which indicates the dispersion in the network and a high variability in the bonds. The standard deviation measures how much variation exists between the values the matrix. Consequently, the interviewees, in choosing the place to visit, take into account and appreciate the 10 types of tourist attractions we consider. The density measurement allows us to define a network in which many links are present. However, the cohesion of a network can be calculated in diversified alternative ways. One of the main techniques of the grid analysis that makes operational the concept of cohesion is based on distance measurement. This procedure elaborates three important cohesion measures.

- Each pair of actors is connected by the minimum length of a path represented by the average distance/values contained in the distance matrix. For all the pairs of nodes, the average of the geodesic distances is represented by 1.063, a low value that allows the pairs of actors to be close together, making the network well connected. It is clear that the value is inversely proportional to the density. If one wanted to evaluate the level of cohesion, the diameter of the network, which represents the longest geodesic distance, can be used as a measure. In our case, no respondents are more distant than two bonds from each other; this would therefore indicate a very compact network.
- The cohesion-based distance index (Distance-based cohesion) ranges from 0 to 1. The more the value approaches “1”, the greater the cohesion of the network. In our case this cohesion index, equal to 0.517, indicates an average cohesive situation.
- The third measure, distance-weighted fragmentation, derives from the fragmentation measure “F” of the network, which indicates the proportion of pairs of nodes that are not reachable from each other. It is an index that varies between “0” and “1”: If all the nodes are reachable from each other (for example in the case of a single component), $F = 0$; if all the nodes are isolated, then $F = 1$. The distance-weighted fragmentation is calculated on the reciprocal distance ($1/d$). This index also varies between “0” and “1”; when the value is “0” it means that every pair of nodes is adjacent to each other (the whole network is a clique); when the value is “1” the nodes are all isolated. In our case we have an average value equal to 0.483, which indicates how each pair of nodes is, on average, close to each other. This measure indicates, as expected, a level of average cohesion among the tourists interviewed.

One of the most important concepts for the empirical analysis of social networks is that of centrality that allows the definition of the positioning of an actor in his own network in purely relational terms. The centrality of a point can be expressed in at least three different ways. The choices of the tourist attraction network were therefore elaborated (Table 5) to analyse the degree, that is the number of contacts and, in particular, the percentage of subjects who had indicated the same answer to the questions asked. The closeness to calculate the centrality index in percentage (therefore, normalised) that indicates the “distance” between the nodes and, finally, the betweenness that indicates the

frequency with which each single node is in the shortest (geodesic) path that connects every other pair of nodes.

Table 5. Descriptive statistics of the main choices of tourist attraction network.

Code	Degree	Close	Between
D1 Varied gastronomy heritage	100.00	28.41	23.02
D2 Identity of territory	77.78	26.64	12.08
D3 Scenic beauty of sea and landscape	100.00	28.41	23.02
D4 Places of Consumption	55.56	11.11	2.30
D5 Places of historical and cultural interest	55.56	10.00	0.00
D6 Experiencing local cuisine	100.00	28.41	23.02
D7 Customs and ways of life	66.67	10.00	0.00
D8 Health food	88.89	26.88	14.29
D9 Interpersonal Relationship	66.67	11.11	3.50
D10 Experiences on holidays	66.67	11.11	3.50
Sum	777.78	192.08	104.73
Max	100.00	28.41	23.02
Min	55.56	10.00	0.00
Mean	77.78	19.21	10.47
Std Dev	17.21	8.57	9.34

Source: The authors.

Degree centrality is the simplest measure of centrality. The social network can show us centrality and power [29,30], which, in our case, highlights the motivations that most attract visitors to a place. The centrality of each node will depend on the number of choices it has received. As you can see, the three strongest motivations that register 100% of the consents are: The Varied gastronomy heritage (D1), the Scenic beauty of sea and landscape (D3) and Experiencing local cuisine (D6). These are followed by the importance attributed to Health food (D8) and to the Identity of territory (D2). The Closeness centrality measure is expressed in terms of “distance” (farness) between points. It means that a node is more central if it is at the shortest distance from many other nodes, i.e., it is “close” to many of the other points; in this sense it can be affirmed that the proximity is the reciprocal of the sum of the distances. The motivations that most attract visitors are D1, D3, D6, and D8, which have a greater closeness. The betweenness centrality indicates which type of attraction most interests visitors. In our case, the most interesting attractions for the interviewees are related to the Variety of gastronomic heritage (D1), the Scenic beauty of the sea and the landscape (D3) and Experiencing local cuisine (D6).

4.2. The Application of Multiple Correspondence Analysis

The choice of conducting the MCA analysis on six of the variables identified was adopted after carrying out various tests and ascertaining that the choice had the highest level (percentage) of variance explained. For each dimension, the analysis calculates inertia and eigenvalue, expressing the amount of total data variability explained. Compatibility with the study carried out was entrusted to the two-dimensional solution, as more effective. In MCA, the first and second dimensions presented, respectively, eigenvalues of 1.428 and 1.076 and inertia of 0.238 (23.8% of variance explained) and 0.179 (17.9% of variance explained). In total, this was eigenvalue 2.504 and inertia of 0.417 (41.7% of variance explained). For the first two dimensions, as seen in Table 6, we see the distribution of discrimination measures of the studied variables and the resulting centroid coordinates of the MCA. For the formation of each axis/dimension reference is made to the discrimination measures (DM) that indicate the most relevant variables and the coordinates of the centroid (CC) that serve the reader to identify each category in the diagram. The variables with the most discriminating power in dimension one are D10 Experiences on holidays, D3 Scenic beauty of sea and landscape, D1 Varied gastronomy heritage, and D2 Identity of territory.

Table 6. Results from MCA for the first two dimensions: distribution of discrimination measures of the investigated variables and of the centroid coordinates of the categories.

Category	Discrimination Measures		Centroid Coordinates	
	Dimension 1	Dimension 2	Dimension 1	Dimension 2
D1 Varied gastronomy heritage	0.293	0.129		
D1+			0.295	−0.196
D1−			−0.994	0.660
D2 Identity of territory	0.138	0.088		
D2+			0.083	−0.066
D2−			−1.671	1.331
D3 Scenic beauty of sea and landscape	0.346	0.199		
D3+			0.316	0.239
D3−			−1.097	−0.832
D4 Places of Consumption	0.039	0.457		
D4+			0.154	−0.528
D4−			−0.252	0.865
D5 Places of historical and cultural interest	0.213	0.034		
D5+			0.445	−0.178
D5−			−0.479	0.191
D10 Experiences on holidays	0.399	0.170		
D10+			0.605	0.394
D10−			−0.660	−0.430
Supplementary variable				
Gender ^a				
Male	0.003	0.008	−0.050	−0.089
Female			0.050	0.088
Age ^a	0.011	0.023		
Age1			−0.175	0.202
Age2			0.031	−0.195
Age3			0.070	−0.007
Age4			0.092	0.068
Level of Education ^a	0.001	0.033		
Edu1			0.035	0.112
Edu2			0.026	−0.169
Edu3			−0.052	0.218
Residents_holiday_work ^a	0.014	0.018		
Residents			0.074	−0.110
Work			−0.316	0.090
Holiday			−0.035	0.185
Active Total	1428	1076		
% of Variance	23,807	17,928		

Note. ^a Supplementary variable. The values in bold refer to the variables whose discrimination measures were close to or higher than the values of the inertia of the dimension. D+ = it is important; D− = it is less important. Source: The authors.

The two dimensions in clear predominance are the variable D4 Places of consumption, D3 Scenic beauty of sea and landscape, D10 Experiences on holidays, and D1 Varied gastronomy heritage. The factorial scores for each attraction and the consequent positioning of the respondents in the dials described by the two main dimensions make it possible to outline some interesting sample profiles. Moving on to examine Figure 4, as we can see, the results of the MCA shows the preferences of the interviewees. There is a clear preference for dimension one, and, therefore, for the peculiarities of Lipari as a whole and its “Genius loci”. Based on the tourist attractions we have selected with the MCA analysis, these are people who are clearly positive dials for “Dimension One”. With reference to “Dimension Two”, in the positive dial we find, in particular those who consider it important to be guided by the holiday experience that you want to achieve: The beauty of the sea and the landscape has been declared important (D3) and the experience lived in the place visited (D10). The categories of variables examined are visible in Figure 4 thanks to the map. Based on the geometric proximity

of the categories of variables in the graphic multidimensional plane, the formation of three distinct preference profiles (P1–P2–P3) was verified.

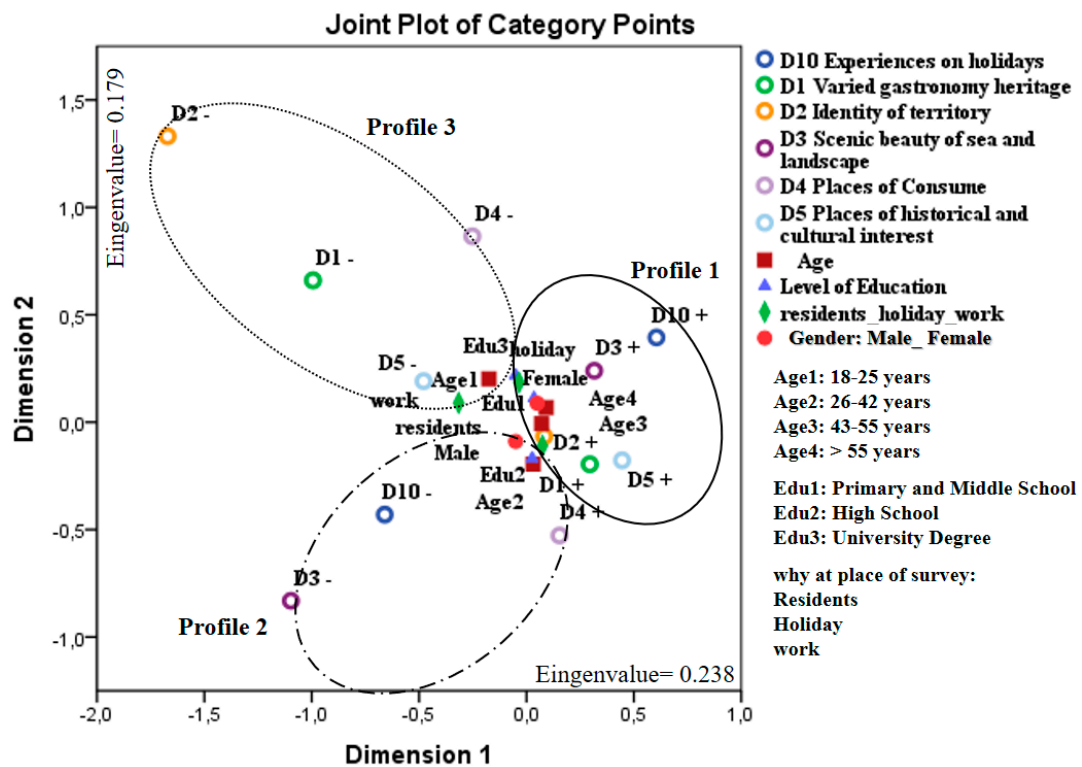


Figure 4. Multiple Correspondence Analysis (MCA) diagram. Source: The authors.

Table 7 describes the main differences between the profiles identified by MCA. The socio-economic characteristics of their preferences compared to the tourist attractions of Lipari have been distinguished. P1—experiential curious tourists—is mainly characterised by women; the age that distinguishes the profile is that greater than 42 years and the level of education is the lowest (primary and middle school). They are residents and people on holiday in Lipari. These are people who express a particular appreciation for the beauty of the sea and the landscape (D3) and for the experience that they live in the visited place (D10+).

They mainly like places of historical interest, such as museums, churches etc. and they have, in general, cultural interests (D5+) and are attracted by the richness of the gastronomic heritage (D1+). Moreover, they are people who are attentive to the identity and environmental sustainability of the territory (D2+). Their main interest is for the holiday itself and the sea, they love taking pictures and telling about their travel experience.

The P2—Viveur—profile is characterised by men. They are mainly from the age group of 25–42 years and have a high level of schooling (High School). They are people interested in places of consumption, restaurants, bars, gastronomy (D4+) and who declare not to be attracted by the beauty of the sea and the landscape (D3–) and not to be interested in the holiday experience “tout court” (D10–).

The subjects of profile P3—hybrid—are distinguished by not having particular interests for cultural aspects (D5–), for the identity of the territory (D2–), for the gastronomic heritage (D1–) or for the places of consumption (D4). The profile includes young people aged 18 to 25. Subjects are graduates and people in Lipari for work purposes.

Table 7. Main differences between profiles identified through MCA.

<p>Profile 1—Experiential curious tourists</p> <p>Sociodemographic characteristics</p> <p>Gender: female</p> <p>Age 3: 43–55 years</p> <p>Age 4: >55 years</p> <p>in Lipari on holiday and residents</p> <p>Level Edu 1: Primary and Middle School</p> <p>The main choices of Tourist attraction</p> <p>D1+ Varied gastronomy heritage, it is important</p> <p>D2+ Identity of territory, it is important</p> <p>D3+ Scenic beauty of sea and landscape, it is important</p> <p>D5+ Places of historical and cultural interest, it is important</p> <p>D10+ Experiences on holidays, it is important</p>
<p>Profile 2—Viveur</p> <p>Sociodemographic characteristics</p> <p>Gender: male</p> <p>Age 2: 25–42 years</p> <p>Level Edu 2: High School</p> <p>The main choices of Tourist attraction</p> <p>D4+ Places of Consumption, it is important</p> <p>D3– Scenic beauty of sea and landscape, no it is not important</p> <p>D10– Experiences on holidays, no it is not important</p>
<p>Profile 3—Hybrid</p> <p>Sociodemographic characteristics</p> <p>Age 1: 18–25 years</p> <p>in Lipari for work</p> <p>Level Edu 3: University Degree</p> <p>The main choices of Tourist attraction</p> <p>D1– Varied gastronomy heritage, no it is not important</p> <p>D2– Identity of territory, no it is not important</p> <p>D4– Places of Consume, no it is not important</p> <p>D5– Places of historical and cultural interest, no it is not important</p>

Source: The authors.

5. Discussion

Visitors and tourists come to places, do things, stay there and leave. The spaces in which they stay constitute their destination. Many different types of tourists interpret in different ways the destinations like an island and in which they live different experiences. The attraction of the islands for tourists will increasingly depend on their ability to develop their own cultural routes and a diversified supply that is as well integrated as possible. To achieve this, it is no longer enough to possess scenic beauty of sea and an attractive landscape: Visitors are increasingly demanding the experience of local cuisine, contact with nature, health food, and culture and identity of the destination [55]. The link with sustainable tourism can attract new forms of responsible tourism and guarantee alternative incomes to small agricultural and fish production units of the islands. In recent years in the Aeolian Islands, alternative and seasonally adjusted tourism is emerging. The new forms of rural tourism spread in the rural and marine villages of the islands are increasingly combined with agritourism, wine tourism, and with fishing tourism.

This study identifies some traits of valorisation of the attractions of the islands, especially the useful factors of the observed cases to capture the complexity of choices of attractions tourism.

In fact, the study has demonstrated that because tourists chose the attractions, it is, in fact, the network characteristics that are influenced by the actions of tourists in choosing the places to visit. Thanks to network analysis, it was possible to make a comparison between the 23 attractions of Lipari island, having both particular and peculiar characteristics from the point of view of the objectives of this study. We wanted to examine the phenomenon from two points of view. The network analysis NA

allowed us to see the attraction of places and the mobility of visitors to visit and move from one place to another on the island, which in line with previous studies [28,32] though of different area. We used the MCA to examine the profiles of the interviewed subjects.

In the light of the above considerations, what is to be aimed at is the setting up of a sustainable tourism (not exclusive) in islands where the traditional activities are link to nature and sea, supporting activities respecting the specific environment and with an increasing tourist demand. But it is important to remember that islands must compete with other tourist destinations so policy-makers should carefully consider whether initiatives are necessary and no danger to sustainability of the territory.

The Aeolian Islands turn out to be a scale-free, small-world network with a hierarchical structure. The findings are closely related to the core and peripheral attributes that contribute to the overall experience of tourists. However, it is notable that tourists usually chose the experience that was particularly impressive for them, e.g., tasting beverages and local cuisine where they are travelling, and represents a great part of their most enjoyable experiences.

Analysing the results obtained through the questionnaires given to 573 tourists on Lipari island, the authors were able to identify three relevant groups: Experiential curious tourists, *Viveur*, and those not interested in the specific attributes of the island, or a hybrid of these, where the attractions play a central or no role, based on the links to and from other attractions of the island. The results of segmentation with MCA show that tourists are different in relation to their characteristics, trip-related behaviours and types of experiences chosen.

6. Conclusions

The novelty of the study can be summarized specially in three aspects.

First, it was observed that each one of the groups delineated has its own specific inclination towards the Aeolian Islands. MCA examined the profiles of tourists in relation to the types of preferred attractions. This methodology of analysis of the MCA has been applied in several studies, [40,53,56] however, from the results that emerged, the MCA analysis was considered more effective and a novelty for a synthetic description of the profiles of tourists. Profiling tourists is an important step towards the implementation of various activities that could increase the awareness and perception of a sustainable tourism area [56].

Second, the study contributes to the literature on behaviour of tourists because the empirical results suggest that several attractions can lead to increase the tourists or “potential tourists” who visit these localities. The new methodological idea was to integrate the analysis of the network examined with the Network Analysis (NA) with a procedure of multiple correspondence analysis (MCA) used to synthesise the relationships that exist between many variables subjected to simultaneous analysis to obtain a reduced number of synthetic variables. We wanted to examine the phenomenon from two points of view. The NA allowed us to see the attraction of places and the mobility of visitors to visit and move from one place to another on the island. We used the MCA to examine the profiles of the interviewed subjects.

Third, this study contributes to help tourism marketers and destination managers understand that they should promote the gastronomy and cultural heritage of the island, together with the identity of territory with scenic landscape, to strengthen the capacity defining touristic strategies. Tourism development and the presence of tourists seem to offer occasions to stimulate the local political class and main public institutions involved in the control of local territory, and to provide them with a new interpretation of existing assets within the island area, to be able to get all the necessary tools to protect the sustainability of the territory as well as see it to fruition This requires integrated planning to put tourism in a balanced relationship in the context of overall development [57,58].

Some limitations of the present study must also be acknowledged because there is an awareness that the analyses that have been conducted have an exploratory nature. They require further deep discussion, looking for any peculiarities of tourists or residents and their behavioural differences,

in terms of the typology of information that is managed. Moreover, educational and cultural levels play an important role in influencing people's behaviour.

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