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# Tourism Management

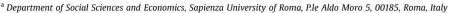# Fuzzy segmentation of postmodern tourists

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## H I G H L I G H T S

- Illustrates the nexus between postmodern tourist and fuzzy clustering.
- A procedure that embraced fuzzy theory from the beginning to the end is proposed.
- A procedure that is able to handle the uncertainty that characterize postmodern era.
- Levels of satisfaction with the destination are used to segment tourists.

## A R T I C L E I N F O

## A B S T R A C T

In postmodern tourism, the experiences of each tourist could not be summarized only through a unique perspective but multiple and disjointed perspectives are necessary. The aim of this paper is to create a nexus between postmodern tourist and fuzzy clustering, and to propose a suitable clustering procedure to segment postmodern tourists. From a methodological perspective, the main contribution of this paper is related to the use of the fuzzy theory from the beginning to the end of the clustering process. Furthermore, the suggested procedure is capable of analysing the uncertainty and vagueness that characterise the experiences and perceptions of postmodern consumers. From a managerial perspective, fuzzy clustering methods offer to practitioners a more realistic multidimensional description of the market not forcing consumers to belong to one cluster. Moreover, the results are easy and comprehensible to read since they are similar to those obtained with more traditional clustering techniques.
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## 1. Introduction

Over the years in both the general marketing and the more specific tourism literature a great debate has generated about the techniques to use in segmentation. In marketing and tourism literature, cluster analysis remains the most favoured method (Dolnicar, 2002; Wedel & Kamakura, 2000) despite the criticisms it has raised (Dolnicar, 2002; Dolnicar & Lazarevski, 2009). A clustering algorithm performs a multivariate description of the data therefore different clustering algorithms produce different solutions (Grekousis & Thomas, 2012) and no single clustering algorithm achieves satisfactory clustering solutions for all types of data sets (Ghaemi, Sulaiman, Ibrahim, & Mustapha, 2009).

A literature review in the tourism field suggests that the majority of segmentation studies used motivations, personal opinions/judgements, or other psychographic variables to segment tourists (see for example Konu, Laukkanen, & Komppula, 2011; Li, Meng, Uysal, & Mihalik, 2013; Prayag & Hosany, 2014). Oftentimes, these kinds of information are captured through qualitative scales, such as Likert-type scales. Despite these kind of scales are widely used in many different research fields, mainly thanks to the ease of developing and administering them, they allow to obtain only an imprecise measurement of the subjective perception of the respondent. To the best of our knowledge, few segmentation studies on tourism have taken into consideration the uncertainty and vagueness that generally characterize qualitative scales (D'Urso, De Giovanni, Disegna, & Massari, 2013, D'Urso, Disegna, Massari, & Prayag, 2015). Over the years it has been demonstrated that fuzzy theory (Zadeh, 1965) is capable to cope with uncertain and/or vague data in a better way than traditional methods (e.g. Coppi & D'Urso, 2002; Benítez, Martín, & Román, 2007; Sinova, Gil, Colubi, & Van Aelst, 2012; Wang, Xiaolei, Yunteng, & Yinhai, 2014; Chu & Guo, 2015). Hence, this study

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suggests to transform the information obtained by qualitative scales into fuzzy numbers before the adoption of any segmentation technique.

Another important issue that must be taken into consideration in the choice of the best algorithm to adopt, but on which little attention has been paid till now, regards the peculiar characteristics of the customers (or tourists in this instance). In the early 90s the marketing and tourism literature has started to debate about and to investigate a new type of tourist, which reflects the current postmodern era. "Postmodern" tourists, in contrast to "modern" tourists, can be described as individuals who enjoy multiple experiences embracing different, sometimes contrasting, life values: travellers who may consume Mac Donald's at the airport but choose to dine at organic restaurants at the destination; tourists who are looking for authentic cultural attractions but also visit Disneyland. Considering the differences between "modern" and "postmodern" tourists, the question arises whether the different clustering algorithms (that can be grouped in non-overlapping, overlapping, and fuzzy algorithms) are interchangeable when it comes to such different behaviours. In this paper we are going to discuss that when it comes to postmodern tourists, the fuzzy algorithms seem to be the most suitable as they are able to capture the "undefined" tourists' behaviour, preferences, emotions, or other feelings, assigning each tourist to each cluster with a certain degree of membership (Tuma, Decker, & Scholz, 2011). Furthermore, fuzzy clustering methods seem to satisfy managerial needs of segmentation with a more realistic multidimensional description of the market place, in which consumers are not forced to belong to one cluster (Zhang, Prater, & Lipkin, 2013).

Accordingly, this study aims to adopt a clustering procedure able to segment postmodern tourists using personal opinions collected through qualitative scales as segmentation variables. The peculiarity of this procedure consists in embracing fuzzy theory from the beginning to the end of the process:

1. transforming the segmentation variables into fuzzy variables;
2. adopting a fuzzy clustering algorithm;
3. profiling the clusters using the fuzzy membership degrees and the fuzzy prototypes.

As such, this procedure is able to capture both vagueness in individual evaluation of linguistic terms and that derived from the uncertainty in assigning units to each cluster.

After a theoretical discussion of the nexus between postmodernity and fuzzy theory (Section 2), the fuzzy segmentation procedure is described (Section 3). In section 4 the case study is presented while section 5 shows and discusses the results, describing how they can be visualized and interpreted. The paper concludes discussing both academics and practitioners implications of the segmentation procedure suggested.

## 2. Literature review

### 2.1. Postmodernism and tourism

In the last 30 years the term "postmodern" has been widely used and applied to a variety of disciplines including literature, arts, history, and also marketing. Postmodernism has been considered as a complex phenomenon, frequently paradoxical and multi-faced in nature, making it a hard concept to define. Under a philosophical point of view, postmodernism is the movement that poses a critique to modernity, the philosophical movement centred around "absolute reality" and universality, just antecedent to postmodernity (Wang, Niu, Lu, & Qian, 2015; Uriely, 1997).

In the early 1990s, postmodernism has started to pertain also marketing studies, where traditional approaches were put into discussion (Brown, 1993) and new marketing approaches were proposed (e.g. Cova & Svanfeldt, 1993; Stern, 1994; Firat, Dholakia, & Venkatesh, 1995). Nowadays, postmodernism is considered to shape today's world society in preferences, choices, and behaviour (e.g. Wang et al., 2015; Goneos-Malka, Strasheim, & Grobler, 2014; Dunn & Castro, 2012; Riefler, 2012). In marketing and consumer behaviour postmodernism has been mainly described by the following characteristics (Brown, 2006; Firat & Venkatesh, 1995): blurring of the distinction between real and non-real multiple and disjointed consumption experiences; lack of commitment to any (central) theme; language as the basis for subjectivity; experiences that allow the coexistence of differences and paradoxes; postmodernism as a culture of consumption.

In tourism, postmodernism has been described by the enjoyment of tourists to move from one tourist experience to the other (Uriely, 1997; Wang, 1999), the intermingling of different motivations (Maoz & Bekerman, 2010; Uriely, 1997), a nature which involves "both-and" rather than "either-or" (Munt, 1994). More recently, it has been further discussed that postmodern travellers cannot be classified under a rigid and subjective term, instead, if questioned, postmodern travellers describe themselves through terms that are subjective, fluid and open to change (Maoz & Bekerman, 2010). As stressed by Maoz and Bekerman (2010), in a postmodern era "each tourist has his/her small narrative to tell, and those small narratives replace the grand and universal narrative of the past" (p. 437).

### 2.2. Postmodernism and fuzzy sets

While in the late 1960s and early 1970s philosophers were discussing issues such as subjectivism and deconstruction, engineers had already realized that human needs and behaviours had become so complex that the binary code of "true or false" was not enough and that a new logic was needed (Ghomshei, Meech, & Naderi, 2008). In the same period, Zadeh presented his first work on fuzzy sets (Zadeh, 1965). Although born and developed independently, fuzzy theory and postmodernism were providing an answer and a point of discussion to the changing needs, behaviours, and believes of the consumer age.

As underlined by Lin and Yeh (2013), "consumer perception is an extremely complex process that involves degrees of uncertainty, imprecision or vagueness". The evaluation provided by a consumer is subjective, thus implying that consumers' perception on a unique aspect or object is different, as demonstrated for example in the study conducted by Hsu, Wolfe, and Kang (2004). In other words, the concept to be evaluated is unique but the mind of the consumer is fuzzy and vague (Lin & Yeh, 2013). This concept is intimately related to the deconstruction, subjectivation, and de-realisation of postmodernism (Derrida, 1967; Foucault, 1969; Lyotard, 1979), and the coexistence of both "true" and "false" or the existence of an in-between value in the postmodern consumer experience. Moreover, information regarding opinions, satisfaction, emotions, and other aspects involving a personal judgement are vaguely defined and captured with imprecise measurements (D'Urso, 2007). In order to investigate these subjective perceptions, qualitative scales, such as Likert–type scales, are often used to formulate both scientific propositions and empirical data (Benítez et al., 2007; Coppi, D'Urso, & Giordani, 2012; Gil & González-Rodríguez, 2012; Li et al., 2013). Unfortunately, using linguistic expressions to capture the complex mind of respondents produces inevitably vague and uncertain evaluations. Therefore, a significant drawback of linguistic expressions on a Likert–type scale is that they entail a source of vagueness and uncertainty in evaluation since they represent subjective knowledge (Coppi & D'Urso, 2002; D'Urso, 2007; Benítez et al.,