The Evolution of Cultural Space in a World Heritage Site: Tourism Sustainable Development of Mount Wuyi, China

Weifeng Guo 1,2, Xiangmin Zheng 1, Fang Meng 3,* and Xiaonan Zhang 3,4

1 Department of Tourism Management, College of Tourism, Huaqiao University, Quanzhou 362021, Fujian, China
2 Department of Tourism Management, College of Tourism, Wuyi University, Wuyishan 354300, Fujian, China
3 School of Hotel, Restaurant and Tourism Management, College of Hospitality, Retail and Sport Management, University of South Carolina, Columbia, SC 29072, USA
4 Department of Hotel Management, College of Tourism Science, Beijing International Studies University, Beijing 100024, China

* Correspondence: fmeng@hrsm.sc.edu; Tel.: +1-803-777-0631

Received: 29 June 2019; Accepted: 23 July 2019; Published: 25 July 2019

Abstract: It is necessary to examine cultural space in tourism destinations, including World Heritage Sites, for the long-term sustainable development of these destinations. Existing studies on cultural space mainly concentrate on the conceptual and textural elements. However, factors influencing the evolution of cultural space still need to be explored for the sustainable development of tourism destinations. Taking Mount Wuyi, a World Heritage Site in China, as a case study, this research examines the evolutionary trend of its tea cultural space. Specifically, this study investigates indicators that influence cultural space and explores its evolutionary mechanism. The vector autoregressive model was used to analyze Mount Wuyi’s tea cultural space evolution from 1996 to 2017. The results reveal that culture had the highest overall development in the tea-space evolution; the market supply and demand were the strongest and most enduring exogenous forces. Moreover, the evolution of tea cultural space demonstrated a multi-stranded interactive evolution model. This study not only enriches the understanding of cultural space evolution in tourism destinations but also offers suggestions for the sustainable development and management of World Heritage Sites.

Keywords: cultural space; space evolution; influencing mechanism; World Heritage Site

1. Introduction

Cultural space is one of the fastest-growing and most-valued tourist attractions in a destination nowadays [1]. According to Oppermann [2], tourists favor rare and specialized local cultural resources. Moreover, turning these cultural resources into cultural space is conducive to the protection and utilization of these unique tourism resources and the sustainable development of the destination.

The French sociologist, Henry Lefebvre, first endowed space with its cultural meaning, and referred to cultural space as “a product of society” (1974) [3]. In 1998, in its Proclamation of Masterpieces of the Oral and Intangible Heritage of Humanity, the United Nations Educational, Scientific and Cultural Organization (UNESCO) declared cultural space a place that involves “traditional and popular” cultural activities. Cultural space has long been defined by anthropologists as the regular “image space” for local residents to express folk culture [4].

With the increasing popularity of cultural tourism, cultural space has been extensively developed as a tourism venue and has attracted considerable research attention. Cultural space in this study is defined as a place or venue where cultural activities such as production and consumption take
place, for example, Disney’s theme parks, art galleries, and music festival venues. It not only provides a type of lifestyle for local residents but also offers tourism-related products or services to tourists based on its space and local culture. Therefore, it is important to examine the evolutionary mechanism of cultural space in tourism destinations, especially changes in its textural element, for sustainable development [5]. The evolutionary mechanism of cultural space in this study refers to the changes and development trends of all various textural elements of cultural space over time and their intertwined influences and functions in cultural space evolution. However, extant research on cultural space mainly focuses on its conceptualization and characteristics [6], such as spatial meaning, cultural value, and symbolic systems, which only express the cultural attributes of space.

The lived experience of local residents and tourists in the space is a symbolic expression of identity and nationality, which endows space with cultural characteristics and values [7]. In addition, unique and rare heritage culture is more appealing to tourists [8], which explains why World Heritage Sites are an important form of destinations for tourists. World Heritage Sites are worldwide cultural and natural heritage sites recognized by UNESCO World Heritage Convention. Examples include the Taj Mahal in India, the Yellow Stone National Park in the U.S., the Palace and Park of Versailles in France, and the Great Wall in China. They represent the “irreplaceable sources for life and inspiration” and have abundant cultural space (http://whc.unesco.org).

Scholars propose that culture and spatiality are two primary components of cultural space [9]. In addition, with the involvement of tourists, cultural space has become the carrier of economic activities and is dominated by commercial behaviors and social structures. Specifically, tourism activities promote the consumption of cultural symbols and the development of a commodity economy. In general, tourists and inhabitants could clash due to the conflicting needs of tourists’ novelty seeking/exploration and local residents’ own space preservation. Even though the confrontation and struggle for converging thoughts on tourism development is a dynamic and continuing process arising from the different interests and needs of inhabitants and tourists, these economic factors do stimulate space commercialization, thus enriching the textural elements of cultural space to include the economic aspect. However, as important indicators for studying the evolution of cultural space, the textural elements are mainly discussed in terms of culture and spatially, largely ignoring the economic aspect.

In addition to the conceptualization and textural elements of cultural space, space evolution has received increasing research attention in academia [10]. The evolution of cultural space is influenced by external driving forces, which interact with each other to achieve a specific function. The external driving forces include multiple aspects. For example, market supply and demand factor drives the generation of more cultural space, such as theme parks, museums, and performing arts venues [11]; government guides the space development with policies and regulations, which further incorporate management elements in cultural space research [12]. More importantly, in cultural space, cultural demand is closely connected to space evolution [13]. Cultural demand drastically varies among tourists due to their different cultural capital, represented by their cultural backgrounds, aesthetic tastes, appreciation, and value orientation. However, the influence of cultural capital on cultural space evolution was only briefly proposed in previous literature [14] but never empirically measured and tested.

Therefore, based on the literature gaps discussed above, this study aims to explore the evolution of tea cultural space in a World Heritage Site by focusing on three textural elements (i.e., internal factors) of cultural space including spatiality, culture, and economy (the “how” question), as well as three external driving forces including market supply and demand, government management, and cultural capital (the “why” question). Specifically, this study re-constructs indicators based on the conceptualization of cultural space by adding economy as an additional textural element to develop an evaluation index of the cultural space evolution and its evolutionary mechanism. In addition, this study further enriches the literature on examining the evolution of cultural space through three external driving forces, in which cultural capital is empirically investigated for the first time beyond
the extant literature. This study would benefit the development and management of World Heritage Sites, as well as the construction of cultural space for the sustainable development of a destination.

1.1. Cultural Space

Space is interpreted as a way of showing localized historical processes [15]. It is an important analytic concept for the study of an organization [16], and one of the most active and vital elements in the tourism industry. Space is also attached to the dialectical relationship between socio-spatial practices and symbolic and cultural meanings [17]. Different spaces result in different spatial patterns [18]. For example, literary space stresses the link between the authors and the settings of their novels [19], conveying human feelings with spatial memory and collective consciousness. In contrast, domestic space involves family and neighbor relationships, as well as customs and rituals within the community [8], which contains symbolic meanings [20]. As for public space, it is not only a geographical structure but also an oral and visual narrative construction [21], creating a sort of social relationship. For example, a city street as a public space provides an opportunity for “others” to express their cultural and social identity [22].

The utilization of space for tourism development has received increasing research attention in recent years. Destinations take advantage of the knowledge economy to actively develop creative space [23], which gradually evolves into tourism space. Tourism space usually caters to tourists’ demand and is constructed as a hyper-real space [24]. According to Oppermann [2], there are four types of tourism space: formal tourism space, informal tourism space, informal and formal tourism space, and “non-tourist” space. Heritage development is an important mode of space construction. Cultural space as a core attraction to tourists has also received considerable research attention [25]. It is a multifunctional and wide-ranging space, which includes not only aesthetic space but also life and service space along with production and consumption [26]. In recent years, cultural space has been examined from anthropological and sociological perspectives [5,27–29], particularly in relation to its meaning, cultural value, and localization history [15]. Cultural space contains a dialectical relationship between social practice and cultural–symbolic meaning. Thus, sustainability of space should be addressed from cultural, social, and environmental angles, especially in relation to cultural sustainability that emphasizes the development of indigenous content and local idioms, as well as social sustainability that deals with social inclusion and community bonds [30].

With tourist activities, cultural space changes from a living space to a workplace for local residents and tourists, including cultural production, consumption, and change [31]. In other words, the destination becomes a space with cultural expressions and symbolic representations of interactions between tourist behaviors and spatial elements. Cultural symbols such as festivals, religion, heritage, and social ties become tourism products [32]. However, to the authors’ best knowledge, how such factors are intertwined with cultural space’s evolutionary process is largely under-researched.

1.2. Textural Elements and Evolution of Cultural Space

Textural elements of cultural space are the expression of its connotation and extension, which includes spatial, cultural, and economic dimensions [33,34]. The first dimension is spatiality. The spatial environment provides a medium for reciprocal contacts between different cultures; the frequent contact among groups contributes to more similar spatial structures [35]. Therefore, space has the duality of structure and behavior, where societal and human activities exert an external influence on it [36]. Tourism space is “a functionally distinctive subspace of geographical space” [33,34]; thus, spatiality is its fundamental element.

The second dimension is culture. Culture is a combination of behavior, language, belief, and value [37], whereas the revival of culture is a process of space creation. MacCannell [38] argues that cultural space contains original elements of traditional culture. Cavalli-Sforza and Feldmann [37] generalize these traditional cultural elements as language, beliefs, and values which often exhibit certain symbolic value through behaviors. Cultural symbols have festive meanings,
i.e., religion and heritage, social bonding, and imagined locality, which form the self-identification of a place [32]. The cultural space incorporates many local cultural elements, such as aesthetics, experience, performance, and creativity, and enhances the cultural attractiveness of tourist destinations. For example, tea cultural space is constructed with cultural symbols such as poetry, art, painting, stone sculptures, and musical instruments, demonstrating aesthetics, entertainment, and other cultural characteristics, and allowing visitors to embrace a sense of cultural identity. Thus, cultural ontological significance is conveyed through cultural space. In terms of culture, humans are the subject of cultural activities and behaviors, and have permanent effects on the cultural environment [33,34].

The third dimension is economy. The economic dimension serves as an extension of the combination of cultural space and the tourism industry. Similar to the cultural dimension, human activities also have permanent effects on the economic environment [33,34], and tourism activities have economic characteristics by nature. Therefore, cultural space is dominated by the space economy and social structure; economic functions are then generated due to tourists’ cultural consumption. Therefore, cultural space is deeply influenced by its spatiality, culture, and economy at all stages of tourism development [25]. In addition, cultural space also contains certain political factors [1], including the geo-social locale of the ethnographic gaze, and the cultural place for ritualized activities and currency exchange [5].

Evolution is the process by which various influential factors interact with each other to achieve a specific function. In the 1970s and 1980s, theories related to the evolution of tourism destinations began to thrive, among which Butler’s Tourism Area Life Cycle (TALC) theory is widely accepted. Tourism Area Life Cycle divides the life cycle of a tourism destination into six stages: exploration, involvement, development, consolidation, stagnation, and decline or rejuvenation. The evolution and transformation of a tourism destination is influenced and driven by exogenous factors, such as policies, transport technology, natural disasters, and climatic conditions [39]. Tourism entrepreneurs and governments stratify tourism space through divisions, subdivisions, and marginalization [40], but this stratification must consider the market because market and space depend on each other.

The construction of cultural space requires high-quality social conditions, which include various service facilities that provide a space for tourists to participate in and connect with one another [39]. Moreover, a sense of identity and “place”, as well as cultural policy, are the main factors that drive the innovation of space. Tourists’ sense of cultural space is inseparable from their own social and cultural capital [41]. The stratification of knowledge, ability, and temperament generated by cultural capital leads tourist consumption towards art and creativity instead of landscape [42]. In summary, external factors—market supply and demand, government management, and cultural capital—provide a theoretical basis and indicators for analyzing the cultural spatial evolution of heritage sites. However, although these three external factors were identified as influencing forces in cultural space evolution, how exactly these factors affect, and to what extent they affect, cultural space evolution, particularly regarding the textural elements (i.e., spatiality, culture, and economy), have been largely ignored in the previous literature. Thus, the evolutionary mechanism of cultural space is unclear.

1.3. Tea Cultural Space

As a form of cultural space, tea cultural space focuses on mining relevant cultural elements and represents one of the most vibrant cultural spaces in the tourism industry. Tea cultural space is an aesthetic space constructed by symbols of tea culture, emphasizing its cultural connotations [43]. It not only supports agricultural, manufacturing, and service industries but is also an important attraction to tourists. Coles and Timothy [44] define cultural space as “the third space” for tourists to visit, as it stores shared memories and mediates conflicts [45].

Tea culture has a history of thousands of years in China, which cultivates numerous tea cultural spaces and deeply influences Chinese lifestyle. With the fast tourism development in China, the industrialization of tea cultural space has promoted the local economy and called for further academic research [46]. As a natural and cultural World Heritage Site, Mount Wuyi in Fujian, China is
the most important biodiversity conservation zone in Asia, and has a history of 12 centuries, with a number of excellent archeological sites and relics. In particular, Mount Wuyi is the birthplace of the world-renowned Da Hong Pao (a kind of oolong tea), which is considered the king of tea due to its color, aroma, and taste. There are numerous precious tea trees, including six ancient Da Hong Pao tea trees over 360 years old.

Mount Wuyi has a rich cultural heritage of tea culture and neo-Confucianism [47], and its tea space has become an important venue for tourists [45]. Mount Wuyi builds its tea cultural space with wide spatial distribution and strong cultural identity, which successfully enhanced tourism development. Its large variety of cultural space includes tea plantations, tea B&B (Bed and Breakfast), teahouses, and tea shops, all expressing their cultural values or patterns. In this study, the tea cultural space in Mount Wuyi is chosen as the study site.

2. Materials and Methods

2.1. Index Selection: Dimensions of Cultural Space

Based on the literature and discussion above, this study examines the evolution of cultural space from the following three dimensions: spatiality, culture, and economy.

First, spatiality, as an important dimension to observe the evolution of space, has three characteristics: physical field, cultural field, and human “presence” [6]. There are four ways of measuring the spatiality of tea cultural space: (a) position, which represents the spatial direction. Every tea cultural space corresponds to a position with a space coordinate. The Nearest Neighbor Index (NNI) measures the distance change among the coordinates, reflecting the degree of spatial aggregation and distribution patterns; (b) quantity, which indicates the scale of space; (c) area, which represents the size of the space; (d) accessibility, which shows the correlation among spaces. The more convenient the space, the higher the spatial correlation [48]. Considering spatiotemporal characteristics of space evolution as well as the objectivity and availability of data, five indicators were chosen to measure the spatiality dimension. These indicators are NNI, scale of tea cultural space, area of tea plantation, mileage of transportation, and airport passenger throughput.

Second, culture reflects connotations of space: (a) the culture of tea’s function. Tea food, tea drinks, and tea medicines are healthcare products. Consumers learn about tea’s function mainly through media. More promotion of tea’s benefits correlates to a larger number of potential buyers, and consequently more tea production. Therefore, the amount of tea production in Mount Wuyi can serve as a substitute indicator of the culture of tea’s function. (b) The culture of the tea industry. Connotations of the tea industry’s culture are indicated by a series of observable operational atmospheres, such as corporate philosophy, rules, regulations and technological processes. It is measured through the annual capacity number of tea tourism and the revenue from admission tickets. (c) The culture of tea service. This is usually demonstrated by tea sets, tea decorations, tea handicrafts, etc. In other words, tourists consume aesthetic products and purchase them in the tea space. Accordingly, sales are used as the measurement. In sum, the amount of tea production, the annual capacity of tea tourism, and the revenue from admission tickets of Mount Wuyi, as well as sales of tea sets, tea decorations, etc. are measured as indicators of the culture dimension.

Third, economy refers to the economic contribution of the space. Tea cultural space involves production and consumption: some space provides services to tourists; some enables tea production for tourists to make purchases; and some space is developed as a tourist attraction for enjoyment. Therefore, the economic contribution of tea cultural space is twofold: the contribution to GDP, and local residents’ income and purchasing power, which is measured by GDP per capita and the Consumer Price Index (CPI). GDP per capita is one of the most widely used indicators to measure regional economic development in Economics. The CPI refers to residents’ consumption of material goods and services, reflecting the reach of their material and spiritual life, and having a significant positive role in promoting the tourism economic development [49]. In addition, the economic dimension of tea
cultural space represents the income that tea generates over a given period, the premise of a stable price for tea, greater tea sales, and higher income of residents. Thus, the economic dimension could be represented by sales of tea, which are measured by two important surrogate indicators: total postal handling in the Wuyishan city, where Mount Wuyi is located, which shows tea sales to other places; the number of output packages delivered outside Wuyishan city, reflecting the volume of tea sales as well as the economic value of tea. In sum, GDP per capita, CPI, total postal handling, and the number of output packages are chosen as indicators of the economic dimension of tea culture space’s evolution.

2.2. Index Selection: External Influencing Factors on the Evolution of Tea Cultural Space

The evolution of tea cultural space is influenced by multiple external factors. Based on previous literature, three key external influencing factors on the tea cultural space evaluation are identified, namely, market supply and demand, government management, and cultural capital [41, 50]. First, market supply and demand are two important components of the tourism industry, where tourist demand is bound to induce changes in supply. In general, the most commonly used index to measure tourist demand is the total number of tourist arrivals [51]. A larger number of tourist arrivals is more likely to induce faster development of the tea cultural space.

Second, government management refers to government policy or guidance. Cultural promotion is the primary approach for brand management and word-of-mouth. Tea culture as the unique local culture in Mount Wuyi, often promoted by the government in Wuyishan through newspapers. Lv and Lu [52] use the amount of newspaper publicity as one of the indicators to evaluate a creative city; therefore, the number of newspaper reports on tea cultural space is employed to measure the local government’s management effort.

Third, cultural capital is a demonstration of people’s cultural competence through knowledge accumulation in family and school settings. Cultural competence is indicated through a series of cultural outcomes, such as knowledge, manners, skills, and taste. Generally, education level is used as an indicator of cultural capital, which is measured through the number of college students [53]. This study employed the total number of tourist arrivals, the number of newspaper reports on tea culture and the number of college students to discover the influence of market supply and demand, government management, and cultural capital on the evolution of tea cultural space.

2.3. Data Sources

The data were obtained from the government of Wuyishan city in the period of 1996–2017, which include all the existing available panel data collected by the city government to date. The data include: (a) the directory of the tea companies, which is provided by the Bureau of Statistics and Administration for Industry and Commerce in Wuyishan City. The company name, premises of the business, enterprise type, registered capital, administrative districts, and opening date are gathered. (b) Data from a variety of statistical yearbooks as well as national economic and social development statistics, including “China Statistical Yearbook on Culture and Related Industries”, “China Statistical Yearbook”, “Wuyishan Statistical Yearbook”, and “Wuyishan Shizhi (City History)”. (c) Official data from Wuyishan Travel Development Co., Ltd., Tourism Administration, and Archives Administration in Wuyishan city. (d) Corporate data obtained from tea companies and logistics companies. The data are also double verified by interviewing experts in the industry and field researchers.

2.4. Data Analysis

Entropy method. This determines the weight from information entropy, and the information entropy measures the extent of disorder in the system in information theory. The greater the dispersion of the index’s value, the smaller the information entropy, which indicates the greater amount of information contained in the index (i.e., greater weight); in contrast, the lower the dispersion of the index’s value, the greater the information entropy, which shows the smaller amount of information included in the index (i.e., smaller weight) [54]. The entropy method not only overcomes the duplication problem
among indicators but also avoids subjective bias for better objectivity and credibility of the study. In the entropy method, Microsoft Excel is used to calculate the information entropy of influencing factors to obtain each index value.

*Vector Auto Regression (VAR) model.* In the VAR model, each endogenous variable is regarded as the lagged value of all endogenous variables in the system to construct the model, which in turn extends the univariate auto regression model to a VAR model composed of multivariate time series variables. The application of the model requires the trending of each variable, a type of non-stationary time series data. The stationary single integer sequence can be obtained through difference calculation, and then the VAR model can be constructed. In this way, although part of the information contained in the horizontal sequence is lost, the overall analysis result is not affected. The VAR model has been widely used in dynamic analysis of the influence mechanism and evolution mechanism of the economic system. In the practical application of the VAR model, impulse response function (IRF) and variance decomposition are commonly used. The econometrics software EViews (version 7.2) is used for VAR model data analysis. Specifically, impulse response analysis and variance decomposition are used to analyze the dynamic influence of the evolution mechanism of the space of tea culture in Mount Wuyi.

3. Results and Discussion

3.1. Overall Profile of Tea Cultural Space’s Evolution

The overall scores for the evolution of tea cultural space between 1996 and 2017 were calculated using the entropy method (Table 1). As Table 1 shows, before Mount Wuyi became a World Heritage Site in 1999, the annual overall score of the evolution of tea cultural space was less than 1%, suggesting that the interaction among spatiality, culture, and economic dimensions evolved naturally at a lower level. After 1999, the overall score of the evolution grew to 2%, showing that the evolution curve gradually went upward. From 2007, the average of the overall score of the evolution reached 8%, scoring 13.3% in 2016 and scoring highest, at 14.8%, in 2017, which means that tea cultural space in Mount Wuyi has been growing very fast since 2007.

Moreover, the scores of different indices fluctuate throughout the evolution. From the vertical perspective, three dimensions of cultural space were generally consistent over the years. First, the weight of the space-related index reached 33.57%, with 36.13% in the cultural dimension and 30.3% in the economic dimension. The average values of all three dimensions was 30%, with only a small difference, indicating that the spatiality, culture, and economy of tea cultural space’s evolution are basically at the same level, with similar development. Among them, the weight value of the cultural dimension was highest, indicating its rising importance and the aesthetic needs of tourists in tea cultural space.

Second, the indices within each dimension were not balanced. In terms of space, the scale of tea cultural space as a key indicator (0.1806) shows a rapid evolution in the amount of space. With regard to culture, the key index of annual sales of tea settings (0.1074) indicates that the tourism industry boosts the service development, with tea as a medium. For the economic dimension, the number of output packages is shown as a core indicator (0.1653). Tea as the signature goods of Wuyishan city reached production of 1,173 tons in 2017 and was mainly sold by mail logistics.

Horizontally, the tea cultural space in Mount Wuyi evolved with a fluctuating growth rate before 2006, then the overall score of the evolution of space gradually became stable. In 1999, the growth rate reached 43.8%, but the SARS in 2003 caused a sharp decline in tourist arrivals, along with decreased sales of tea and negative growth in tea cultural space. The growth rate quickly increased to 64% in 2005, followed by a moderate annual growth of 10% afterwards.
### Table 1. Textural elements and overall score of the evolution of tea cultural space 1996–2017.

<table>
<thead>
<tr>
<th>Index Year</th>
<th>Spatiality</th>
<th>Culture</th>
<th>Economic</th>
<th>Overall Score of Evolution of Cultural Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scale of Tea Cultural Space</td>
<td>Average Nearest Neighbor Index (ANNI)</td>
<td>Area of Tea Plantation</td>
<td>Mileage of Transportation</td>
</tr>
<tr>
<td>1996</td>
<td>0.0011</td>
<td>0.0010</td>
<td>0.0010</td>
<td>0.0085</td>
</tr>
<tr>
<td>1997</td>
<td>0.0015</td>
<td>0.0100</td>
<td>0.0077</td>
<td>0.0369</td>
</tr>
<tr>
<td>1998</td>
<td>0.0010</td>
<td>0.0182</td>
<td>0.0071</td>
<td>0.0010</td>
</tr>
<tr>
<td>1999</td>
<td>0.0012</td>
<td>0.0031</td>
<td>0.0073</td>
<td>0.0227</td>
</tr>
<tr>
<td>2000</td>
<td>0.0011</td>
<td>0.0063</td>
<td>0.0083</td>
<td>0.0227</td>
</tr>
<tr>
<td>2001</td>
<td>0.0030</td>
<td>0.0386</td>
<td>0.0087</td>
<td>0.0218</td>
</tr>
<tr>
<td>2002</td>
<td>0.0047</td>
<td>0.0444</td>
<td>0.0097</td>
<td>0.0374</td>
</tr>
<tr>
<td>2003</td>
<td>0.0064</td>
<td>0.0478</td>
<td>0.0083</td>
<td>0.0374</td>
</tr>
<tr>
<td>2004</td>
<td>0.0053</td>
<td>0.0350</td>
<td>0.0111</td>
<td>0.0374</td>
</tr>
<tr>
<td>2005</td>
<td>0.0072</td>
<td>0.0405</td>
<td>0.0140</td>
<td>0.0390</td>
</tr>
<tr>
<td>2006</td>
<td>0.0064</td>
<td>0.0583</td>
<td>0.0145</td>
<td>0.0383</td>
</tr>
<tr>
<td>2007</td>
<td>0.0145</td>
<td>0.0591</td>
<td>0.0233</td>
<td>0.0390</td>
</tr>
<tr>
<td>2008</td>
<td>0.0186</td>
<td>0.0559</td>
<td>0.0273</td>
<td>0.0390</td>
</tr>
<tr>
<td>2009</td>
<td>0.0370</td>
<td>0.0638</td>
<td>0.0646</td>
<td>0.0334</td>
</tr>
<tr>
<td>2010</td>
<td>0.0454</td>
<td>0.0637</td>
<td>0.0782</td>
<td>0.0601</td>
</tr>
<tr>
<td>2011</td>
<td>0.0591</td>
<td>0.0667</td>
<td>0.0881</td>
<td>0.0570</td>
</tr>
<tr>
<td>2012</td>
<td>0.1001</td>
<td>0.0701</td>
<td>0.0921</td>
<td>0.0570</td>
</tr>
<tr>
<td>2013</td>
<td>0.1063</td>
<td>0.0700</td>
<td>0.0962</td>
<td>0.0998</td>
</tr>
<tr>
<td>2014</td>
<td>0.1274</td>
<td>0.0674</td>
<td>0.1124</td>
<td>0.1003</td>
</tr>
<tr>
<td>2015</td>
<td>0.1417</td>
<td>0.0689</td>
<td>0.1124</td>
<td>0.0852</td>
</tr>
<tr>
<td>2016</td>
<td>0.1576</td>
<td>0.0676</td>
<td>0.1144</td>
<td>0.0743</td>
</tr>
<tr>
<td>2017</td>
<td>0.1753</td>
<td>0.0662</td>
<td>0.1160</td>
<td>0.0813</td>
</tr>
<tr>
<td>weight</td>
<td>0.1806</td>
<td>0.0114</td>
<td>0.0985</td>
<td>0.0161</td>
</tr>
</tbody>
</table>

Note: All values were calculated using the entropy method to nondimensionalize each variable. The overall score of evolution of cultural space was calculated via Vector Auto Regression (VAR) model.
3.2. Analysis of Tea Cultural Space’s Evolution based on VAR Model

3.2.1. Augmented Dickey–Fuller (ADF) Test

To construct an econometric model, the first step is to check the data, and evaluate the original assumptions of the model and its economic significance. The ADF test is used to examine the stationarity of a time series, which is a prerequisite for data analysis. As shown in Table 2, Y, F1, F2, F3 all had a constant term, and F3 had a trend term.

<table>
<thead>
<tr>
<th>Table 2. Augmented Dickey–Fuller (ADF) unit root test.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Code</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>The evolution level of tea cultural space Y</td>
</tr>
<tr>
<td>Market supply and demand factor F1</td>
</tr>
<tr>
<td>Government management factor F2</td>
</tr>
<tr>
<td>Cultural capital factor F3</td>
</tr>
</tbody>
</table>

C is the constant term, T is the trend term, the number is the lag order, ** significant at 5% level, *** significant at 1% level.

Thus, the constant and trend term tests are needed for the F3 variable sequence, and the constant term tests without the trend term were performed for the remaining three variables. Results show that Y, F1, F2, and F3 can achieve stability by the difference of first order. The values of the ADF test were smaller than the critical value at 5% or below, and are in line with the price-theory approach.

3.2.2. Granger Causality Test

This test is to examine whether two variables correlate with each other or not. If one of the variables can be influenced by the lagged effect of another variable, it indicates that they have Granger causality [55]. By further analyzing whether significant causal relationships exist between the drivers F1, F2, F3, and Y tea cultural space, the evolution of tea cultural space can be predicted through the changes of drivers as a consequence.

As Table 3 shows, the independent variables F1, F2, and F3 all had Granger causal influence on Y (the null hypothesis is rejected), indicating that market supply and demand has a positive influence on the evolution of tea cultural space, which is consistent with the theory of supply and demand in the tourism industry. Government management and cultural capital also had significant Granger impacts on the evolution of tea cultural space.

<table>
<thead>
<tr>
<th>Table 3. Granger causality test.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>F1</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>F2</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>F3</td>
</tr>
</tbody>
</table>
3.2.3. Unit Root Test of VAR Model

The unit root test was then used to test the validity of the estimated VAR model. If all the inverse of unit root values are less than 1, it is possible to fall within the unit circle, which means that the model is stable. Otherwise, the model is unstable. The VAR model’s function reveals the statistical properties of the sequence data. The endogenous variables of the market supply and demand, government management, and cultural capital are regarded as lagged functions that have relationships with other endogenous variables. In the meantime, these endogenous variables are random disturbance terms and impact the variable systems dynamically. As a result, the evolution can be explained by observing evolutionary and dynamic changes of tea cultural space in response to these impacts. On the condition that the ADF values with the first order of difference are stationary, the VAR model is constructed with four variables, including F1 market supply and demand, F2 government management, F3 cultural capital, and Y, the evolution level of tea cultural space.

Figure 1 shows that all the inverse of unit root values fell within the unit circle, indicating that the model is stable, so more in-depth analysis—impulse response and variance decomposition analysis—can be performed.

![Inverse Roots of AR Characteristic Polynomial](image)

**Figure 1.** Inverse of unit root value.

3.2.4. Analysis of Impulse Response Function

The impulse response function (IRF) is used to analyze the impact of random disturbance terms on other endogenous variables in the system [55]. By applying an impulse with the standard deviation size, other endogenous variables are influenced by the dynamic structure of the model, then both the current and future values of these variables are achieved [56]. The effects of the three influencing factors (i.e., market supply and demand, government management, and cultural capital) are further revealed through the range of the confidence interval of impulse response function and the response time. The larger the range of the confidence interval, and the longer it lasts, means that the influential factors exert bigger impacts. If the impulse response function is stable in the long run, the effect of impulse gradually tends toward zero, which indicates smaller impacts of influential factors.

Thus, by applying positive standard deviation information of market supply and demand, government management, and cultural capital to the evolution of the tea cultural space as disturbance terms, the impulse response paths and mechanisms were further explored. As shown in Figure 2, the evolution levels of tea cultural space fluctuate in response to changes in F1 market supply and demand factor, F2 government management factor, and F3 cultural capital factor. The middle solid lines in the figures represent the impulse response function, and indicate the responses of the evolution level of tea cultural space to those influential factors. The two vertical dashed lines show confidence.
A unit positive impulse was applied to the market supply and demand factor, then the endogenous variable tea cultural space evolution captured it and responded with the impulse function. As shown in Figure 2a, the influence decreased over the first to fourth periods, followed by a rapid increase, and reached its highest point in the sixth period. The influence then fell to a lower level and went up and down. After the market supply and demand factor was impacted, the influence then moved to the tea cultural space through the tourism market, bringing the same direction of impact to the evolution. In addition, the impact demonstrated large and long fluctuation, suggesting more significant influential power. Therefore, market supply and demand was the main factor that promoted the evolution of tea cultural space. According to the demand theory, the larger total number of tourist arrivals and the greater supply of tea cultural space leads to the evolution of its essential attributes—spatiality, culture, and economy.

Figure 2b shows the dynamic effect of government management on the evolutionary process of tea cultural space. When a positive unit of impulse was applied to the government management factor, the evolution of tea cultural space responded with curvilinear fluctuations, showing rapid growth over the first three periods, then slowly declined over the 4th to 6th period, and rose in the 7th to 8th period. It verified the timeliness of government administrative initiatives such as cultural promotion. Initially, the effect of administrative intervention with great promotional effort was significant; this was followed by a weakening impact and the next round of government promotion, thus demonstrating repeated fluctuation in the process.

As shown in Figure 2c after a positive unit of impulse was given to the cultural capital factor, the tea cultural space also evolved with curved fluctuation. There was an increase over the first two periods, then a decrease from the third period to the fourth, followed by an increase at the fifth period, and then it dropped again. It shows that the impact on evolution brought about by the cultural capital factor was in the same direction and also durable. The cultural capital factor is primarily indicated by the number of college students. Therefore, with the implementation of the policy to popularize higher education in China, the number of college students has been constantly increasing. The increased education level of the public will lead to higher demand for culture and aesthetics in Mount Wuyi’s tea cultural space, which further enhances the upgrading and evolution of tea cultural space.

3.2.5. Analysis of Variance Decomposition

Variance decomposition is used to objectively assess the importance of every factor in the system, implied by the contribution differences that every factor generated to the endogenous variable (usually expressed as variance) [55]. This method examines the significance of the drivers, which are the market supply and demand, government management, and cultural capital, in relation to the evolution of tea cultural space.

Table 4 shows the variance decomposition results for every endogenous variable. Standard error represents the change between the current and future value of disturbance terms in every
endogenous variable in the model. The values in columns F1, F2, F3, and Y reveal the proportion of variance contribution caused by every disturbance term. Table 4 shows that every variable F drives the evolution of cultural space Y variable with different degrees of importance, which are shown as follows: F1 market supply and demand factor was 36.5%, whereas the F2 government factor reached 31.2%, and the F3 cultural capital factor was 4.4%. The self-evolution of tea cultural space contributed 27.9%. Specifically: (a) Variable F1 contributed the largest influence on Y, meaning that the market supply and demand had the largest delayed effect on the tea cultural space evolution. Variance contribution in the first period was 46.9%, then it declined to 28.1% in the third period and began to rise from the fourth period and remained at 36% thereafter. It indicates that the factor of market supply and demand had a strong positive relationship with the evolution of tea cultural space, with a long-lasting effect and late-developing advantage. (b) Variable F2, the government management factor, showed more stable and obvious knock-on effects on the delayed effect of the tea cultural space evolution. The contribution of government management rose to the highest, 45.2%, in the third period, then went down to 34% and tended to be stable, indicating that the government management factor positively and significantly influenced the evolution of tea cultural space. (c) Variable F3 cultural capital factor had a relatively weak influence on the Y evolution of tea cultural space. Its variance contribution remained at 3% over the 1st to 3rd period, then rose to more than 5% in the fourth period and remained stable, indicating a weak but sustained impact on the evolution of tea cultural space. (d) In addition to these external driving forces, the tea cultural space Y also had a strong self-adjustment capability. The first period had the highest contribution, which was 49.1%, then it fell to 32.1% over the second period and remained at around 25% after the third period. It indicates that, although tea cultural space self-evolved, the impact of external factors had larger and lasting impacts. Therefore, the evolution of tea cultural space’s dependence on market supply and demand, government management, and cultural capital is relatively stable.

### 4. Conclusions

#### 4.1. Main Conclusion

Extant literature on the conceptualization and indicators of cultural space, as well as external driving forces on the evolution of cultural space, is still limited and not fully consistent in research findings. Specific examination of tea cultural space in World Heritage Sites is even scarcer. In the context of heritage tourism development, from a multidisciplinary view such as socio-economics, this study analyzed the structure of tea cultural space from spatiality, culture, and economic dimensions, and further examined how external factors—market supply and demand, government management, and cultural capital—influenced the evolution of tea cultural space. This study, for the first time, examines the economic factor as an additional textural element in measuring cultural space beyond the conventional elements of spatiality and culture. It is also the first study to empirically test the influence of cultural capital as an additional external driving force on cultural space evolution. Using the data
collected from 1996–2017 in a World Heritage Site in China as a case study to examine tea culture space and its evolution, this study provides meaningful contributions to the sustainable development of cultural-heritage tourism destinations.

Mount Wuyi’s tourism development started in 1979, when various drivers interacted with each other and promoted the evolution of tea culture space in this destination. This study conceptualizes and measures the textural elements of cultural space, which include spatiality, culture, and economy. By exploring the comprehensive evolution level and evolutionary mechanism of the textural elements of World Heritage Sites, the following conclusions were reached: (1) During the evolution of tea cultural space, the culture dimension had the highest comprehensive evolution level (36.13%), whereas the economic dimension had the lowest (30.3%). Compared to the economic dimension, cultural dimension in tea space comprises various activities, such as tea ceremony and tea art performance, which can be developed in a short period of time and quickly innovated and changed/modified. In contrast, the economic dimension is associated with GDP per capita and residents’ consumption of material goods and services, which are not likely to change abruptly. (2) Market supply and demand had the greatest and strongest endurance impact on the evolution of tea cultural space, whereas the cultural capital factor had the least impact and weaker stamina. Market supply and demand was measured by multiple indicators such as tourism revenue, tourist arrival, and average disposable income. Tourist demand had a critical impact on tea cultural space evolution, as tourist demand directly motivates local residents and industry practitioners to provide more space for tea culture symbol consumption and tea-related shopping consumption, thus largely promoting the tea cultural space evolution. Comparatively, cultural capital had the least impact on tea cultural space evolution, largely because tourist consumption mainly focused on tea-related shopping (rigid, inelastic demand) rather than tea culture symbol consumption (flexible demand). (3) Tea cultural space evolves in a multi-strength interactive way. Market supply and demand, government management, and cultural capital intertwined in affecting the tea cultural space evolution. Specifically, tourist demand set the origin and internal driving force of the evolution of tea cultural space; tourism development boosted the local economy and motivated residents and investors to participate in the construction of the tea cultural space, which represents the external driving force of tea cultural space evolution. At the same time, local government assists tea cultural space development through favorable policy, financial support, and media promotion.

One of the major contributions of this study is the theoretical model of the evolutionary mechanism of cultural space in World Heritage Sites (Figure 3). The model shows that market supply and demand, government regulation, and cultural capital promote the evolution of cultural space. Extant literature primarily focuses on the first two factors, i.e., market supply and demand and government regulation, but rarely examines the role of cultural capital in cultural space evolution, particularly in world heritage sites where tourists generally desire rich culture and history. Therefore, it is necessary and meaningful to examine cultural capital in addition to conventional influencing factors such as market supply and demand and government regulation.

Cultural space evolution is closely related to the long-term sustainable development of destinations such as World Heritage Sites, thus requiring a steady and balanced development of spatial, cultural, and economic dimensions. In terms of practical implications, managers of World Heritage Sites should make full use of cultural resources to reinforce and manage the production of cultural spaces. Specifically, managers should strengthen the regulation of the market supply and demand force. With the increasing demand of tourism and the number of the World Heritage Sites, the consumption of cultural products has also increased. Managers should regulate capital investment and accelerate cultural space production by adjusting commodity structure and optimizing resource allocation. Second, managers should practice stronger policy control of cultural space production. Managers can promote space production, such as the Cultural Expo Park, by investing in more tourism elements. They can also stimulate cultural space construction through project approval, land use, financial support, etc. Finally, managers could cater to tourist needs and preferences for cultural consumption.
By considering tourists’ aesthetic tastes, appreciation, and value orientation, the connotations of cultural space could be enhanced.

Figure 3. Influential mechanism of cultural space evolution in World Heritage Site.

Another major research conclusion is that the culture dimension of cultural space evolved the fastest during the self-evolution process, which differs from the previous literature that spatiality element was the fastest internal evolutionary element [3]. Spatiality has been commonly recognized as the most active element in space, and any structural transformation in culture, economy, and society involves a change in space [14]. However, the evolution of cultural space is a multi-dimensional development, not only in the change of quantity but also in the extension of the connotation of space culture. Cultural symbols such as beliefs, values, and behavioral narratives enrich spatial connotations and promote cultural innovation. Cultural elements are full of vitality in the process of cultural space evolution. The cultural needs of modern tourists pay attention to aesthetic taste and unique local characteristics, which motivate and drive cultural space suppliers and destination operators/managers in establishing the cultural space. Suppliers should focus more on the integration of local cultural elements and aesthetic symbols for the production of space and to promote the evolution of cultural elements. For example, the suppliers could develop some interesting or beautiful souvenirs that are based on the local culture, or organize activities for tourists to experience with local people. Because market supply and demand is the biggest driving force for the evolution of cultural factors, managers should vigorously explore the cultural needs of tourists, and incorporate more local culture, aesthetic elements, and value beliefs into space production. For instance, logs, stones, sculptures, tree branches, textiles can all be used as decorating materials in tea cultural space to present the natural tone; tea art, flower art, fragrance, music, and pictures should be integrated in the creation of cultural space for tourists.
4.2. Limitations and Future Research

There are several limitations to the study. First, some of the raw data was not complete in the 1990s. The tourism industry of Mount Wuyi has been developing for more than 30 years. However, the data before the 1990s were incomplete. It is impossible to fully analyze the early stage of Mount Wuyi’s tea cultural space evolution. Therefore, this study only utilized 22 years of data from 1996 to 2017 for a quantitative analysis of the evolutionary mechanism. Second, this study only used the data from one single tourism destination, Mount Wuyi. More world heritage sites could be studied in the future to verify the results of this study. Third, future research could focus on the influence of market supply and demand on the cultural dimension of tea cultural space, so as to provide more in-depth insights into the ways in which tea cultural space develops. Moreover, empirical research is suggested to further examine the interactive effect of the three dimensions of spatiality, culture, and economy on tea cultural space evolution. Last but not the least, this study solely examined tea cultural space, which is typical in China but not generalizable in other cultural spaces or destinations. A call for research is suggested to study other culture-embedding food and beverages within a typical space, such as wine and whisky in destinations worldwide.

Author Contributions: W.G. designed the study, analyzed the data and interpreted the results with X.Z.’s (Xiangmin Zheng) advice. F.M. and X.Z. (Xiaonan Zhang) wrote/revised the final English manuscript.

Funding: This research was funded by (1) Fujian Provincial Social Science Planning Project “Cultural Space in Tourism Destination of World Heritage Site: Process, Scale and Mechanism” (Grant number: FJ2017B023); (2) China National Social Science Foundation “China National Park Recreation Space Suitability: From the Tourism Big Data Perspective” (Grant number: 19XGL010).

Conflicts of Interest: The authors declare no conflict of interest.

References
15. Johnson, N.C. Framing the past: Time, space and the politics of heritage tourism in Ireland. Political Geogr. 1999, 18, 187–207. [CrossRef]
34. Włodarczyk, B. Space in tourism, tourism in space: On the need for definition, delimitation, and classification. *Tourism* 2014, 24, 25–34. [CrossRef]


© 2019 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/).