

A STUDY ON COFFEE PRODUCT CATEGORIES SOLD IN LANDSCAPE COFFEE SHOPS

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ABSTRACT

Regarding delicacies, people are no longer satisfied with mere good taste, they also consider the overall feeling conveyed by the restaurants, including the decorations, the created atmosphere, and services, which all affect consumers' decisions whether dine. Nowadays, casual style is particularly the leading trend. Modern restaurants have innovative ideas in food, leisure, and consumption, which are different from traditional restaurants that only meet customers' needs for daily meals. Therefore, many featured restaurants are opened with unique styles to attract consumers. This study investigated the decision-making processes for coffee product categories sold in the landscape coffee shops. The landscape coffee shops in Taiwan all have unique featured services and functions to attract consumers. The quality of coffee products sold in the landscape coffee shops is one of the factors that consumers consider, and is the key to sustainable operation of coffee shops. As the preference of consumers varies, this study used analytic hierarchy process (AHP) to investigate the coffee tastes of most consumers, allowing landscape coffee shops to focus on the popular coffee product in order to achieve sustainable operation. Based on the results of literature review, expert interviews, and AHP, this study provides useful suggestions to landscape coffee shops.

KEYWORDS

Landscape Coffee Shops, Analytic Hierarchy Process, Coffee Beans

1. RESEARCH MOTIVES AND PURPOSES

Besides offering the food and beverage (F&B) services, landscape coffee shops also provide customers with natural or artificial beautiful sceneries. Each landscape coffee shop has its own unique style or atmosphere. In addition to natural scenery, the coffee shops are decorated according to the surrounding landscape in order to attract consumers who may enjoy coffee or beautiful scenery. The consumers are able to indulge in coffee, as well as delightful views, thus gaining a high-quality leisure experience. Since the government's implementation of the five-day work week to stimulate the tourism market in Taiwan, going outdoors and experiencing nature have become the leading tourism activity in Taiwan. The coffee shops with unique natural landscape, green mountains and rivers, mountain streams, various flowers and plants, integrated with the arts and humanities, have become popular destinations for the general public to spend their weekends. Coffee shops in mountainous areas with streams, that are not severely overdeveloped or damaged, have become popular destinations for the general public to spend their leisure time. Therefore, the industry of landscape coffee shop has rapidly developed. However, with the increasing competitive market of landscape coffee shops, in addition to emphasizing the unique landscape of coffee shops to sustainably develop and maintain advantages, operators should create coffee products with heterogeneity. Common coffee drinks on the market are generally divided into Italian, Americano, and hand dripped coffee. This study intends to investigate which products are the favorites of most consumers.

Globally, approximately 66 countries plant coffee beans. Coffee beans can be divided into 4 categories: Arabica, Robusta, Liberica, and Dewevrei/Excelsa. The most widely planted coffee beans around the world are Arabica and Robusta. In Taiwan, the current common coffee beans are Arabica, Robusta, and Liberica. Espresso is usually used as the basis of coffee drinks mixed with other ingredients (e.g. milks or cocoa powder), such as Latte, Cappuccino, Caramel Macchiato, and Mocca, without over-diluting the coffee ingredients. In general, Italian espresso is stronger, and Americano is lighter. Hand dripping can retain unique aromas, such as floral aroma, fruity aroma, and chocolate aroma of coffee beans from various places. Landscape coffee shops should choose a particular coffee drink as their specialty, which has become one of the important issues. This study used the AHP to investigate the factors affecting the landscape coffee shop operators' choice of coffee drink as a specialty in order to improve operating performance and achieve sustainable operation.

2. LITERATURE REVIEW

In order to collect the data of the current public preference for coffee drinks in landscape coffee shops, this study used the following research methods and procedures.

2.1. AHP

AHP was proposed by U.S. scholar T. L. Saaty, at the end of the 1970s[1]. This method can integrate qualitative and quantitative data to deal with the decision-making problems of complicated social, political, economic, and technical aspects. It can convert decision makers' complicated decision-making thoughts into systemic, modeling, and mathematical data, in order to solve multi-objective, multi-level, and multi-criteria decision-making problems. In addition, it can accurately confirm the weight factors of each evaluation indicator to a certain extent. The basic process of AHP is to decompose a complicated problem into various elements. These elements are then divided into groups according to the relations of domination and subordination to form an orderly hierarchical structure. Based on this structure, pairwise comparison is applied to determine the relative importance of the various elements in each hierarchy. The weight of various elements in decision-making is determined based on those judgments to enable decision makers to more easily accept the relations of affecting factors.

Teng and Tseng[2,3] suggested that the use of AHP can be divided into two parts: the establishment of hierarchy, and assessment of the hierarchy. AHP uses preliminarily expert and scholar assessed factors of complicated problems, which are presented as a simple hierarchical structure. Afterwards, scale assessment is applied to perform pairwise comparison of the factors, and develop the matrix. Eigenvectors are then obtained, and the priorities of factors of the hierarchy are compared. The consistency of a pairwise comparison matrix is tested to check whether there is any error, and whether the matrix can be provided as reference. The procedures of AHP are as shown in Figure 1. Traditional AHP uses a hierarchical structure to affect the complicated relations among factors, and connect them systemically. As pairwise comparison is used in AHP, the opinions of experts can be clearer and more effectively reflected. AHP first analyzes and divides a complicated decision-making problem into several relevant hierarchical structures. The factors of each hierarchy are displayed using a correlation tree. Experts then perform pairwise comparison to determine the relevant importance of these factors. Afterwards, linear algebra is used to calculate the relevant importance (which can be regarded as priority) of the decision-making factors of each hierarchy, as compared to that of the objectives of the upper hierarchy and the highest hierarchy. The relevant importance (priority) of each factor is calculated downward, hierarchy by hierarchy. Finally, relevant importance can calculate the weight of each factor affecting the objective, which is presented in a decision-making system.

Theoretically, it is simpler and easier to operate AHP, and results can be used to effectively obtain the common consensus of most experts and decision makers. In addition, it can present complicated factors affecting the assessment in a simple hierarchical structure, as shown in Figure 2. Moreover, it enables decision makers to more easily accept the relations of affecting factors[4-6].

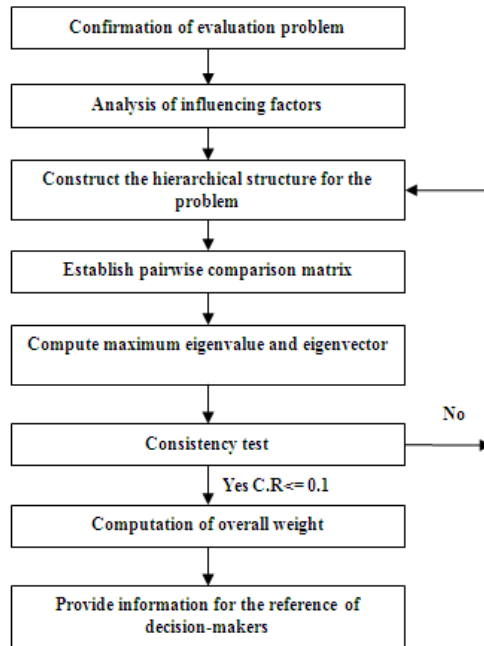


Figure 1. AHP process [2,3]

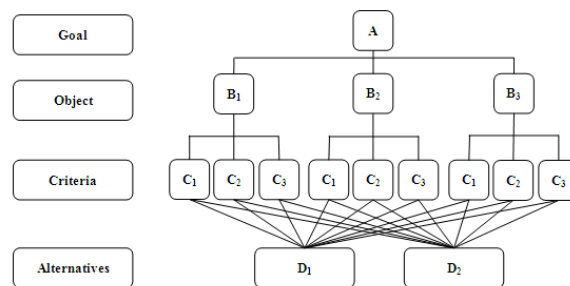


Figure 2. AHP hierarchical structure[2,3]

2.2. INTERVIEW SURVEY METHOD

This study selected the personnel of the F&B industry, the coffee industry, tour guides, and personnel in the leisure/tourism industry, as comprehensive interview respondents, asking them about their preference for coffee drinks and their personal experiences, in order to obtain more specific data. This study then designed a questionnaire according to the data collected from the interviews. The results of interviews were used as an important factor for assessment. Moreover, this study further analyzed and designed a questionnaire for assessment and the subsequent

analyses, based on the analysis of the samples collected in the questionnaire survey system. This is the main research procedure and structure of this study. It is intended that the use of AHP can help better understand the choice of specialty coffee drinks[5]. Pairwise comparison of the factors of each hierarchy should be performed under the premise that a certain factor of an upper hierarchy is used as evaluation criterion. Therefore, it was necessary to design a questionnaire for each pairwise comparison. The subjects completed the questionnaires based on a 1-9 scale (scale for each pairwise comparison of factors). According to the results obtained from the questionnaire survey, this study developed the pairwise comparison matrix, used a computer to obtain the eigenvalue and eigenvector of each pairwise comparison matrix, and then tested the consistency of the matrix[6-8].

3. RESEARCH METHOD AND PROCEDURES

The implementation procedures of this study are as shown in Figure 3. This study conducted literature review, expert interviews, and a questionnaire survey, to investigate the important factors affecting landscape coffee shops' opinions on choices of specialty coffee drinks. The data collected from the questionnaire survey were analyzed using AHP. The factors affecting landscape coffee shops' choices of specialty coffee drinks and their weighted relations were summarized. AHP can convert a complicated problem into a systemic hierarchical structure by decomposing the problem. The weight of each factor was analyzed, hierarchy by hierarchy, as based on quantitative scoring, which can be provided as the basis for overall assessment.

In general, each landscape coffee shop in Taiwan has its own specialty coffee drink to attract consumers. This study investigated the standards and priorities that are applied to the selection of coffee drinks, in order to provide references for landscape coffee shops in selecting specialty coffee drinks. AHP was used to establish the "assessment of product choice of landscape coffee shops," as shown in Figure 4, and design the questionnaire for investigation, data collection, and analysis. The ultimate goal was to analyze the critical factors affecting operators' choices of specialty coffee drink for their landscape coffee shops. To assess landscape coffee shops' perceptions and assessments for specialty coffee drinks, this study divided the hierarchy into 3 levels. Level 1 was the assessment of product choice of landscape coffee shops; Level 2 was the factors affecting the assessment; Level 3 was the lowest program constructs. Pairwise comparison was performed on the factors, where 5 scales were (as shown in Table 1): strong, slightly strong, quite strong, very strong, extremely strong, and intermediate value. The pairwise comparison matrix was developed based on the structure of the questionnaire. The assessment value of the factors of each hierarchy was calculated based on meta-analysis of the group decision.

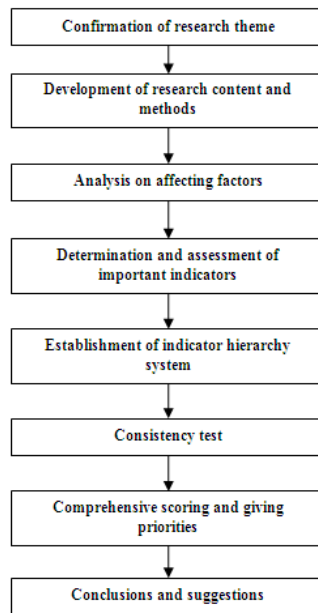


Figure 3. Research flowchart[7-9]

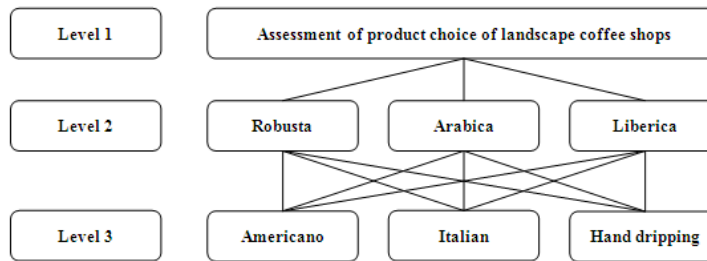


Figure 4. Hierarchical Structure of Landscape Coffee Shops' Choice over Specialty Coffee Drink

Table 1. AHP evaluation scale semantics and descriptions [10,11]

Scale evaluation	Semantics	Meaning descriptions
1	Equally strong (equally important)	Two factors are equally important
3	Slightly stronger (slightly more important)	According to experience judgment, one factor is slightly more important than another
5	Quite strong (quite important)	According to experience judgment, a factor is strongly preferred.
7	Extremely strong (extremely strong)	A factor is extremely preferred.
9	Absolutely strong (absolutely important)	A factor is evidenced as absolutely important.
2, 4, 6, 8	Two adjacent intermediate values	A compromise value between the above descriptions

4. RESEARCH RESULTS

Excel and Expert Choice 2000 was used to analyze data, and AHP was used to calculate the weights of various constructs. The verification process is as follows:

- The pairwise comparison matrix obtained using Expert Choice for data analysis is as shown in Table 2:

Table 2. Pairwise Comparison Matrix of Affecting Factors at Level 2

Affecting factors	Robusta	Arabica	Liberica
Robusta	1	2.3	8.1
Arabica	0.434782609	1	9
Liberica	0.12345679	0.111111111	1
Total	1.558239399	3.411111111	18.1

The sum of the column of each affecting factor in Table 2 was used to calculate the standardized values, as shown in Table 3:

Table 3. Standardized Pairwise Comparison Matrix and Weight of Affecting Factors at Level 2

Affecting factors	Robusta	Arabica	Liberica	Weight
Robusta	0.641749914	0.674267101	0.447513812	0.587844
Arabica	0.279021702	0.293159609	0.497237569	0.356473
Liberica	0.079228384	0.03257329	0.055248619	0.055683

- The results met the requirement of AHP, as proposed by Saaty (C.I. ≤ 0.1 & C.R. ≤ 0.1). Therefore, the consistency of this matrix was acceptable. The remaining constructs of goal and indicators were also verified through this process. The summary analysis showed that C.I. ≤ 0.1 & C.R. ≤ 0.1 , thus, the consistency of the matrix was acceptable, as shown in Table 4.

Table 4. Weights and Consistency Values

Goal	Evaluation Criterion	Weight	Priority	Consistency Value
Assessment of product choice of landscape coffee shops	Robusta	0.587844	1	C.I.=0.049912931 C.R.=0.086056777 C.I. ≤ 0.1 & C.R. ≤ 0.1
	Arabica	0.356473	2	
	Liberica	0.055683	3	

The weights and consistency values in Table 5 were calculated using the calculation methods mentioned above:

Table 5. Weights and Consistency Values

Factors	Evaluation criterion	Weight	Priority	Consistency Value
Robusta	Americano	0.330504	2	C.I=0.04972 C.R.=0.08572
	Italian	0.551735	1	
	Hand dripping	0.117761	3	
Arabica	Americano	0.234825	2	C.I=0.01059 C.R.=0.01826
	Italian	0.672531	1	
	Hand dripping	0.092644	3	
Liberica	Americano	0.577336	1	C.I=0.05653 C.R.=0.09746
	Italian	0.357575	2	
	Hand dripping	0.065089	3	

- Table 6 shows the results of consistency testing. As seen, the priorities of choice of specialty coffee drink of landscape coffee shops are in the order of Italian, Americano, and hand dripping, as shown in Figure 5.

Table 6. Sum of the weighted evaluation

Choice	Sum of the weighted evaluation	Priority
Americano	0.310141212	2
Italian	0.583984272	1
Hand dripping	0.105874517	3

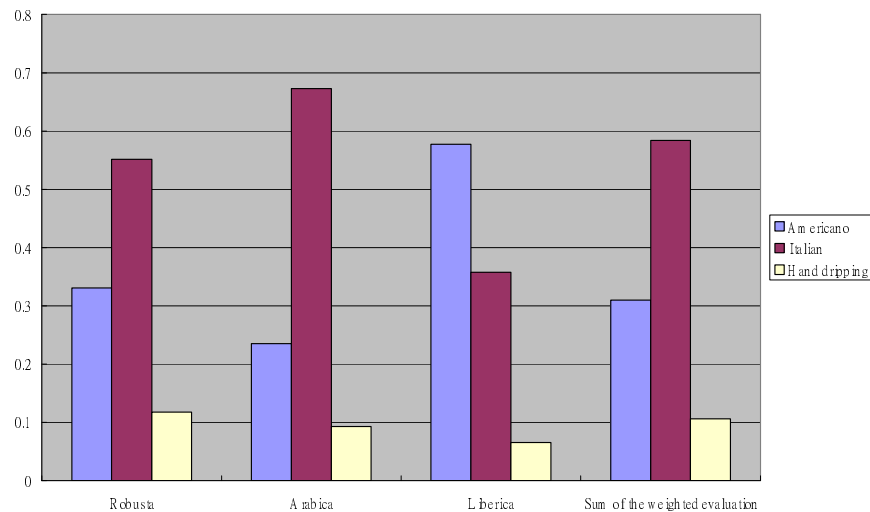


Figure 5. Sum of the weighted evaluation

According to the data above, landscape coffee shops operators' choice of specialty coffee drink is in the following order: Italian, Americano, and hand dripping coffee.

5. CONCLUSIONS

Traditionally, assessments of the choices of specialty coffee drinks for landscape coffee shops tend to be restricted to existing conditions. Under the situation where information is insufficient or incomplete, the basis of judgment will change. The current choices of specialty coffee drinks in landscape coffee shops have become diversified. Analysis based only on traditional impressions and maximum profits is insufficient for the selection of adequate specialty coffee drinks. Based on some of the results mentioned above, it is generally accepted that the current choice of specialty coffee drinks of landscape coffee shops are mainly Italian coffee and Americano coffee. The proportion of hand dripping coffee is low, suggesting that operators of landscape coffee shops should improve on their brewing skills of Italian coffee.

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