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Study of the Consumer Life Style and the Shape Preference of Ming Style Furniture

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***Abstract*—This paper explored the preferences of Ming style furniture in different lifestyle. First, basedon the AIOs Lifestyle Scale, the questionnaire was constructed. And then though the factor analysis, cluster analysis and OnewayANOVA, the furniture consumption concept was evaluated, the lifestyle group was classified and renamed, At last, the different preferenceson Ming-style furniture were analyzed.**

"Pursuit of fashion" groups prefer a strong sense of curve and complex Ming-style furniture; "pragmatic taste" groups prefer straight, slim and simple Ming-style furniture; "conservative doctrine" groups have no obvious tendency on the preference of furniture shape.

Keywords—Ming Style Furniture; Lifestyle; AIOs; Preference degree

I. INTRODUCTION

Ming style furniture is an important representative of Chinese furniture, Chinese furniture is an unique school and components in China and the world furniture history [1]. With the improvement of life quality and the strengthening of aesthetic consciousness, the life requirements are getting higher and higher, the pursuit of life is also increasingly prominent, more and more people tend to buy Ming style furniture to dress up the environment.

However, due to the exchange of Chinese and Western culture, as well as changes in modern lifestyles, too traditional furniture probably cannot meet the needs of modern consumers. From the consumer perspective, the structure of Ming-style furniture is complex, and its cultural connotation is also profound, so consumers often do not know how to buy the right furniture by themselves; From designers and manufacturers perspective, due to lack of proper communication Means and tools, they cannot accurately understand the needs of users, and cannot communicate with consumers effectively. Modern Chinese style furniture must base on the contemporary user needs as the center and starting point. In order to design suitable furniture for different ethnic groups, designers should investigate and analyze the consumer living environment, attitudes and other lifestyle patterns, to understand the needs of contemporary users.

Therefore, the purpose of this paper is to investigate the relationship between different ethnic groups and their preferences of Ming style furniture, and to establish an objective communication platform. It can provide a Chinese furniture design reference and improve design efficiency.

The purpose of this paper is summarized as follows:

- To investigate the consumer lifestyle, to understand theclassification of Ming style furniture consumer groups.
- To understand thepreferences of different groups on the Ming style furniture.

II. LITERATURE REVIEW

A. Ming-style Furniture and Official Hat Chairs

"Ming-style furniture" in its broad sense, including the manufacture of furniture in the Ming Dynasty, regardless of general wood, folk daily necessities, or precious wood, carved furniture, all of them can be classified as Ming-style furniture; Modern furniturewith the 'Ming' style, also can be called Ming-style furniture. In its narrow sense it includes the precious and beautiful furniture from Ming to the early Qing Dynasty.

Ming-style furniture according to function can be divided into five categories: chair, table, bed, cabinet, and other categories. The official hat chair is one kind of armchair, which includes the "four-headed official hat chair" and the "Southern official hat chair" [2].As a representative of the Ming-style furniture, this paper will focus on the study of this chair

The line-based modeling is an important feature of Ming-style furniture, and is worth learning[3]. The line performs leading role in furniture modeling.Line is divided into two major categories of straight lines and curves. Therefore, this study will mainly consider line modelingin Ming style furniture.

B. Lifestyle

Lifestyle is a systematic concept, which refers to a whole or a part of a unique or representative way of life [4]. The origin of the concept of the lifestyle is vague, but its roots can be traced back to the poets, naturalists and philosophers in sixteenth century [5]. Rainwater, Coleman and Handel [6] emphasized the importance of interpreting shopping and consumption behavior in lifestyle context. Lazer [4] in 1963 echoed earlier convictions concerning the potential richness and value of lifestyle concept, and presented a preliminary definition of lifestyle. Wells and Tigert argued that the lifestyle is a combination of personal action, interest, preference, and opinion[7]. Because of the different scope of application, scholars have different interpretations about the definition of life style, but the basic idea is consistent.

The definition of lifestyle proposed by Lazer in 1963, was quickly adopted as the most widely cited interpretation of the lifestyle concept. It is the most commonly used concept in today's researchof lifestyle. He believes that life patterns have three indicators: consumer activities, interests, and opinions.

C. Lifestyle Scale（AIOs）

Plummer [8] complements the concept which proposed by Lazer. Plummer proposed that, in addition to activities, interests, and opinion, demographic variables should be added asthe fourth facets and nine variables.Thesefour facets constitute the AIOs variable scale (see Table I). Activities mainly focus on human behavior, such as where to meet friends, shopping and other activities; interestsare consumers' preferences for job, fashion, food, money, work, etc.; opinions refer to the ideas and feelings aboutthe surroundings,products, brands, economic andsocial issues etc.; the basic characteristics of consumers, that is, demographic variables, such as age, gender, region and so on. In other words, there are variables in consumer groups, and these variables lead to differences in shopping behavior, and the difference may exist a certain regularity,this regularity is worthwhile for product design.

TABLE I. AIOs[8]

	Activities	Interests	Opinion	Demographic Variables
1	Work	Family	Self	Age
2	Hobby	Family affairs	Society	Education Level
3	Social	Jobs	Political	Income
4	Vacation	Community	Business	Career
5	Entertainment	Pastime	Economic	Number of Families
6	Club	Fashion	Education	Residence
7	Community	Food	Product	Geographical Environment
8	Shopping	Media	Future	City Size
9	Sports	Achievement	Culture	Family Life Cycle

D. Preferences

Preferences lead to the direction and behavior of purchasing decisions, resulting in purchasing a particular product, rather than other products [9]. It is refers to the visual preference for certain shapes.

III. METHODOLOGY

This paper first designed the questionnaire of consumer demographic variables, lifestyle patterns and perceptual preferences; And then used mean, factor analysis, cluster analysis, Oneway ANOVA and other statistical methods to analyze the collected data from questionnaire. The research flow of this paper is shown in Figure1.

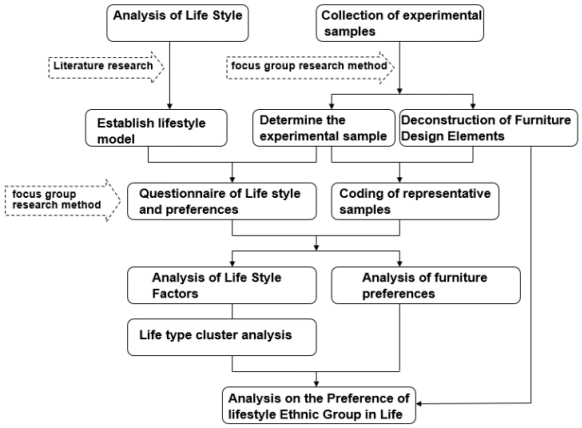
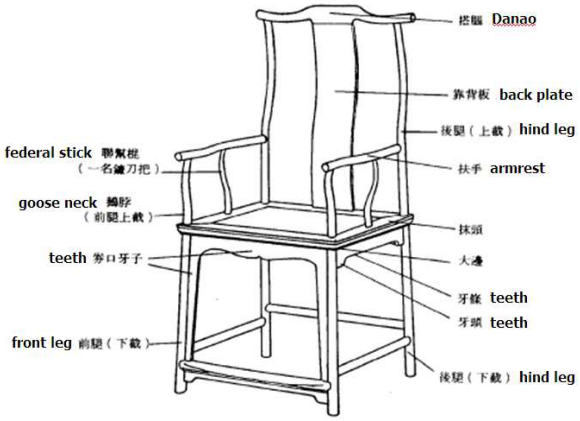


Fig. 1. Research Process.

A. Sample Selection

(1)Analysis of Ming StyleFurniture Elements

First, this studydecomposed the structural of Ming-style furniture (see Figure 2), and divided them into the parts of the Danao, armrest, goose neck, federated stick, teeth, leg, hind leg and back plate.



a.

Fig. 2. Structural parts of Ming - style furniture [2].

Danao, it refers to the top crossbar at back of the chair, is available for the head rest. In general, similar parts of this sitein other furnitureare also called "Danao."Goose neck, it refers to the front vertical woodunderthe armrest.Federated stick, it refers to a vertical woodunderthe armrest, betweengoose neck and hind legs. It is planted on the chair plate, connected with the armrest.Teeth, is often used at the cross-angle of vertical file and horizontalfile. It connects the legs,and plays the role of durableand decoration.[2].

Then experts group is invited to analysis and discuss on the components of the modeling elements. And classify itaccording to theimpact degree. Finally, the main styling elements are classified into four modeling units: Danao, armrest, federated stick, and teeth.

(2)Sample Selection

44 traditional and modern Ming-style furnituresamples (see Figure 3) are collected. The samples need to exclude the colorfactor, because this studymainly discusses the furniture modeling.So the samples converted to non-color grayscale images through image processing software. And then experts group is invited to analysis the form of samples, extract the characteristics of modeling unit, and classified its attribute.

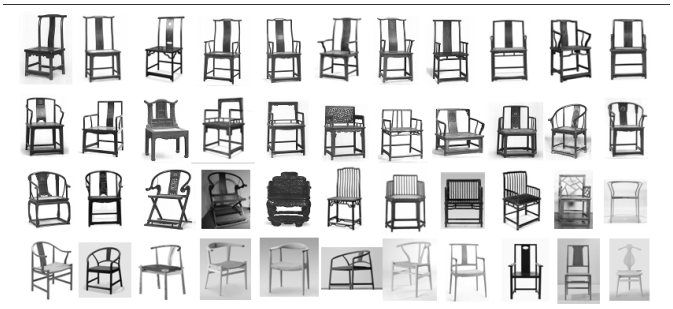


Fig. 3. Furniture samples.

Then, the focus group classified the furniture samples according to the four characteristic attributes of "Danao", "armrest ", "federated stick" and "teeth". Based on the chairtype, modeling feature, and the number of each modeling feature Proportion, the focus group selected 11 representative samples as questionnaire samples (see Table □).

TABLE II. EXPERIMENTAL SAMPLE AND NUMBER

No.	1	2	3	4	5	6
Samples						
No.	**7**	**8**	**9**	**10**	**11**	
Samples						

B. Questionnaire Design

In this paper, Plummer's AIOs scale is used as the basic structure of the questionnaire, including four aspects: Activities, Interests, Opinions and Demographic Variables. The contents of the questionnaire mainly focus on Ming-style furniture consumer intentions, purchase behavior and basic data survey and so on. After the initial completion of the questionnaire, the focus group of experts tested and amended the questionnaire.

The formal questionnaires are divided into three parts: the first part is the personal data related to the demographic variables, including gender, age, occupation, living area and so on. The second part is the related question based on lifestyle scale. The third part is the investigation of Ming style furniture preference degree.

The questionnaire uses a fifth-order Likert Scale, and the left and right ends of the scale are a set of opposing adjectives, such as disagreement - consent, and with a score of 1 to 5 represent the sensation of the subject. The score 1 means does not agree with the content of the statement, the score 5 means fully agree with its content. The analysis of this scale can reflect user's life style and attitude toward Ming-style furniture, in order to explore the user's preferences and perception.

Young consumers purchasing power is gradually increased, its market potential share will continue to expand [10]. Chinese young generation has become the mainstream of China's high-end consumer market[11]. Therefore, the distribution of questionnaires mainly faced 18 to 40years old middle-aged groups.

IV. RESULTS

In this study, 100 questionnaires were distributed and 100 questionnaires were collected. Among them, 97 valid questionnaires were completed, the recovery rate was 97%.

A. Demographic Variables Statistics

The results are as follows (see Table □): the number of women in the subjects was larger, accounting for 63.54%; The highest number of subjects aged 18 to 25 years, accounting for 76.71%;The number of subjects live in urban and rural areas is almost equal; Most subjects have a bachelor's degree, accounting for 66.67%; Students accounted for 48.96%; Those who did not participate in the work accounted for 52.08%;Annual income of less than 30,000 yuan accounted for 57.29%; No design background of the subjects accounted for 63.54%.

TABLE III. DEMOGRAPHIC VARIABLES STATISTICS

Gender	***Men***	***women***			
Number %	35 36.46%	61 63.54%			
Age	***<18***	***18-25***	***26~30***	***31~40***	***41~50***
Number %	2 2.08%	65 76.71%	15 15.63%	10 10.42%	2 2.08%
	51~60	***>60***			
	1 1.04%	1 1.04%			
Urban and Rural Areas	***Urban***	***Rural Area***			
Number %	49 51.04%	47 48.96%			
Education	***<High School***	***College***	***Bachelor Degree***	***>Master***	
Number %	4 4.17%	11 11.46%	64 66.67%	17 17.71%	
Career	***Student***	***Production***	***Salesperson***	***Market Public Relations***	***Customer Service***
Number %	47 48.96%	2 2.08%	8 8.33%	4 .17%	2 2.08%

	Administrative Logistics	***Human Resources***	***Financial Audit***	***Civilian***	***Management***
	3 3.13%	5 5.21%	2 2.08%	10 10.42%	3 3.13%
	Teacher	***Professional***	***Others***		
	6 6.25%	3 3.13%	1 1.04%		
Annual Income (RMB)	***<30,000***	***30,000~80,000***	***90,000~15,000***	***16,000~300,000***	***>300,000***
Number %	55 57.29%	21 21.88%	15 15.63%	4 4.17%	1 1.04%
Years of Work	***Not Yet***	***<5years***	***6-12years***	***>13years***	
Number %	50 52.08%	27 28.13%	16 16.67%	3 3.13%	
Design Background	***No Design Background***	***Learn Design***	***Work in Design Industry***		
Number %	61 63.54%	25 26.04%	10 10.42%		

According to the demographic analysis, the subjects were mostly young and highly educated people. Such people in future market will grow into a major consumer power, the study of furniture perception based on such groups,is conducive to the development of furniture market, so it is consistent with the purpose of this study.

B. Factor Analysis of Life Style Facets

According to thequestionnaire option of the lifestyle part, factor analysis was performed using SPSS. The principal factor analysis (PFA) was used to determine the KMO value by Varimax method. KMO is the sampling quantity of Kaiser-Meyer-Olkin. The larger the KMO value, the more common factors between the variables, the more suitable for factor analysis. According to scholar Kaeiser[12], if the KMO value is less than 0.5, it is not suitable for factor analysis[13]. In addition, the significance(Sig.) values of the Bartlett's Test should be less than 0.05 in order to use factor analysis method. After SPSS analysis, the KMO value of this study was 0.809, the significance value was 0.00, so there have common factors between the relevant matrices, which means it was suitable for the factor analysis (see Table □)

TABLE IV. KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.809
Bartlett's Test of Sphericity	Approx. Chi-Square	594.164
	df	66
	Sig.	0.000

The first component can explain the variability of 41.508%, the second component variation is 19.320%, while the first component and the second component cumulative total variation is: 60.829% Meaning that these two components can explain the overall 60.829% (see Table □). And there are 2 eigenvalues greater than 1.00. Theprinciple which can determinethe number of factors is: eigenvalue size. Eigenvalues represent the total variability that can be explained by a certain factor. The greater the eigenvalue, the stronger the explanatory power. Generally speaking, the eigenvalue is greater than 1 before it can be regarded as a factor. Eigenvalues smaller than 1, indicating that the variance is smaller than a single variable variants and cannot exist in the form of factors[14].

TABLE V. TOTAL VARIANCE EXPLAINED

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.981	41.508	41.508	4.981	41.508	41.508	4.496	37.469	37.469
2	2.318	19.320	60.829	2.318	19.320	60.829	2.803	23.360	60.829
3	.921	7.674	68.502						
4	.805	6.709	75.211						
5	.606	5.051	80.262						
6	.563	4.690	84.952						
7	.440	3.671	88.623						
8	.403	3.357	91.979						
9	.350	2.915	94.894						
10	.273	2.278	97.172						
11	.202	1.683	98.855						
12	.137	1.145	100.000						

Extraction Method: Principal Component Analysis.

After Factor analysis, the reliability test can further certifies the reliability and effectiveness of the questionnaire. If the reliability of a scale is higher, it means that the gauge is more stable. According to scholar Gay[15], if the reliability coefficient is above 0.90, the reliability of the test or scale is very good. However, due to inconsistencies between scholars, some scholars set in 0.80, some scholars believe that 0.70 above, is acceptable minimum reliability value (referring to the entire scale). however, if the degree is less than 0.60, the research tool needs to be re-prepared[13]. In this study, two factors were analyzed, and two common factors were extracted. The Cronbach's alpha is 0.863 (see Table □). It means that the scale items are fairly homogeneous, and therefore all items are applicable to this study.

TABLE VI. RELIABILITY STATISTICS

Cronbach's Alpha	N of Items
.863	12

Through the factor analysis of lifestyle (see Table □), a total of two components were selected, and then be renamed. First, the "value and rational" factors pay more attention to function, price, material, quality, and pay more attention to the views of others, the purchase of furniture is more rational, so named as the value and rational factors; Second, " Visual and emotional" factors focus on personality, like the popular, novel shape, so named as the appearance and emotional factors.

TABLE VII. FACTORS ANALYSIS OF LIFESTYLE

	Component	
	1	2
Select furniture with family or friends	0.870	
Like high quality furniture	0.830	
Attention to furniture materials and materials	0.822	
Attention to the furniture function	0.794	
Like inexpensive furniture	0.765	
Will participate in discount promotions	0.749	
Attention to furniture brand	0.529	
Attention to others' opinions when	0.456	

purchasing		
Will buyunusual furniture		0.855
Like unusual furniture		0.851
Will buy novelty and popular furniture		00.767
Attention to popular appearance		0.733
Factor naming	**value and rational**	**Visual and emotional**

C. Group Classification andRenaming

Cluster analysis is based on lifestyle factors. In this paper, K-means cluster analysis is used to group the subjects. Based on the rationality of the number of subjects and the rationality of the group's feature, the subjects is divided into three groups. The result is shown in Table □, and the three groups achieved significant differences. And then according to the feature of each group, three clusters are named: the cluster one pay more attention to the appearance and more emotional, so named "pursuit of fashion" groups; cluster two paymore attention to value and more rationality, so named "pragmatic taste" groups; cluster three bias to neutral of the values, named "conservative doctrine" groups.

TABLE VIII. ANALYSIS OF LIFESTYLE CLUSTERS AND FACTOR DIMENSIONS

Factor Dimension	**Cluster**			**F**	**Sig.**	**Scheffe**
	1	***2***	***3***			
Number of clusters	53	34	9	—	—	—
value and rational	0.10316	0.46170	-2.35171	71.573	0.000	2>1>3
Visual and emotional	0.71498	-1.00389	-.41795	91.254	0.000	1>2>3

D. Analysis of Relationship between Lifestyle and Ming Style Furniture

This section focuses on the relationship between the three types of lifestyle and the preferences of Ming style furniture. The effect of lifestyle on Ming furniture preferences(see Table □) is analyzedbyOneway ANOVA method.

A total of five samples showed significance, they aresample 2, 6, 7, 8, and 10. By comparing the mean values, it can be found that the "conservative doctrine" group have lower scores on the samples, and the preferences of the furniture do not show a significant tendency; the "pursuit of fashion"group have higher degree of preference for sample 2, 6 and 8; "Pragmatic taste" grouphave higher degree of preference for sample 7 and 10.

TABLE IX. SIGNIFICANCE TEST OF LIFESTYLE GROUP AND MING STYLE FURNITURE PREFERENCE

Sample	**F**	**Sig.**	**Mean**		**Scheffe**
 2	6.437	0.002	1 pursuit of fashion	2.87	2>1>3
			2 Pragmatic taste	3.32	
			3 conservative doctrine	2.00	
	6.027	0.003	1 pursuit of fashion	3.21	2>1>3
			2 Pragmatic taste	3.41	
6			3 conservative doctrine	2.00	
 7	3.472	0.035	1 pursuit of fashion	3.11	1>2>3
			2 Pragmatic taste	2.97	
			3 conservative doctrine	2.22	
 8	4.648	0.012	1 pursuit of fashion	3.28	2>1>3
			2 Pragmatic taste	3.68	
			3 conservative doctrine	2.44	
 10	3.991	0.022	1 pursuit of fashion	3.57	1>2>3
			2 Pragmatic taste	3.00	
			3 conservative doctrine	2.67	

"Danao", "armrest", "federated stick" , "teeth" and "legs " is the main component of Ming-style furnituremodeling. The modeling characteristics (see Table 10 X)of furniture samples 2, 6, 8 are: in sample 2, the "Danao", "armrest", "gooseneck" are used in the shape of the curve; in sample 6, the "federated stick" is used of curve modeling; in sample 8, "armrest", "goose neck" is used of curve modeling; In addition, the three samples of the "legs"have adopted the structure of the teeth.

The modeling characteristics of furniture samples 7 and 10 are: "Danao", "armrest" and "goose neck" are simple straight shape; no "federated stick"; "legs" have no "teeth" components.

"Pursuit of fashion" groups prefer curve lines, and more complex Ming-style furniture; "pragmatic taste" groups prefer straight, slim, simple Ming-style furniture; "conservative doctrine" groups haveno obvious tendency on the preference of furniture shape.

TABLE X. ANALYSIS OF FURNITURE MODELING BASED ON ETHNIC PREFERENCE

Sample N.	***2***	***6***	***8***
Pursuit of fashion			
Sample N.	***7***	***10***	
pragmatic taste			

V. DISCUSSION

This paper explores the classification of lifestyle groups and the preference of different groups on Ming- style furniture. First, through the AIOs Lifestyle Scale, the questionnaire was constructed and the factors of furniture consumption were evaluated by factor analysis, cluster analysis and Oneway ANOVA. And then the lifestyle groups were classified and renamed. At last, the different groups preferences on Ming-style furniture is analyzed and summarized.

According to the characteristics of the furniture consumption, the lifestyle groups were classified through the methods of factor analysis and cluster analysis. The group Is divided into three types. And then according to different elements, the groupswere renamed after the "pursuit of fashion", "pragmatic taste" and "conservative doctrine".

The analysis of the shape and structure about Ming-style furniture shows that the "pursuit of fashion" groups prefer a strong sense of curve and complex Ming-style furniture; "pragmatic taste" groups prefer straight, slimandsimple Ming-style furniture; “conservative doctrine” groups haveno obvious tendency on the preference of Ming-style furniture.

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