

Influencing Factors of Online Furniture Purchase Behavior Based on Analytic Hierarchy Process

Changlong Yu, Wei Liu,* Yinan Fei, Jiaqi Chen, and Ziyang Hu

With the continuous development of the Internet economy, online furniture sales are increasingly becoming an important channel for consumers to purchase furniture. In order to investigate the influencing factors of consumers' preference for purchasing furniture online, this paper aims to find out the influencing factors of online furniture consumption and their weight relations by using the literature research method and Delphi method to clarify the influencing factors of online furniture consumption, followed by the Analytic Hierarchy Process (AHP), from the Target Level, Criterion Level, and Sub-criterion Level. Weight analysis was carried out on the influencing factors of online furniture consumption. The three primary indicators included Personal Factor, Product Factor, and Service Factor. The 16 secondary indicators included Personality Traits, Revenue, Occupation, etc. An index system model was established for online furniture consumption based on the above factors. It was concluded that consumers are most influenced by the price of furniture among Product factors when choosing online furniture. The findings were consistent with the AHP model data when tested using a grey prediction model. The data from this study can therefore provide an important reference for online furniture product development and marketing promotion.

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Keywords: Online furniture; Influencing factors; AHP; Weightings; Grey Forecasting Model

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INTRODUCTION

Online shopping has been considered one of the influential factors in the development of the internet, initially led by the United States, where companies used internet platforms to post information about their products and thus attract customers to their physical shops. This approach allowed consumers to choose products online and then go offline (physical shops) to experience the process of purchase and thus reduce the risk associated with consumption (Rampell 2010). With the improvement of logistics level, the rise of a new generation of online payment represented by Alipay in China (Ge *et al.* 2018), which has also led to the transformation of online shopping, coupled with the global outbreak of COVID-19, the wood processing industry and furniture manufacturing enterprises in various countries have fallen into a downturn of varying degrees. Taking central European countries as an example, Croatia and Slovenia have experienced huge disruptions in the market lockdown under the influence of the epidemic (Kaputa *et al.* 2018), prompting a large number of local small and medium-sized furniture enterprises to go bankrupt, and as a result, online furniture sales began to grow rapidly (Barcic *et al.* 2018). "Online Shopping" has become one of the main means for consumers to choose how to shop (Adibfar *et al.* 2022). According to the survey, before 2019, online shopping

accounted for 10 to 15% of the overall retail sector in the US, with overall mostly offline shopping. However, since March 2020, consumers on Amazon in the United States have spent more than 35% in the same period compared with the amount in the previous year, and Statista data from Germany in the same year shows that online furniture sales in the United States have accounted for 27% of this market, of which Amazon has become the world's largest e-commerce furniture trading platform. This has accounted for 33% of cross-border e-commerce (Fig. 1) (National Bureau of Statistics of China). As the Internet economy continues to mature and the logistics system continues to improve, the furniture industry has also gradually adapted to the e-commerce marketing model, with furniture as the representative of large durable goods. In sum, by launching a new model of online shopping, Internet businesses provide consumers with standardized goods and services through an online platform, while the traditional sales-oriented physical shops are upgraded to a set of product display, consumer experience, pre-sales, and after-sales service as one of the new Internet shops (Ge *et al.* 2018).

Since May 2020, e-commerce furniture sales have started to grow continuously, and the market share of online furniture brands in China has reached over 80% (Alibaba Research Institute 2020), while the number of physical furniture shops has been declining year by year, from 179 in 2016 to 149 in 2020 (National Bureau of Statistics of China). At the same time the scale of the furniture industry is still expanding (Xiong *et al.* 2017), and industry clusters and furniture industry features are gradually taking shape (Steinhoff *et al.* 2019; Kumar *et al.* 2021). The development of the Internet has become a big trend in the furniture market, which is gradually becoming an important part of the online shopping strategy (McBride 1997; Sadoski *et al.* 2002). It is predicted that the number of users buying furniture online will increase (Vin *et al.* 2019; Ariadne Consulting Series Research Report 2022), and that the sales platform of the furniture industry will no longer be limited to a single offline model, but that it will develop more in the direction of “E-commerce” and “Online” (Chen and Yu 2021; He 2022).

Online furniture sales platforms are gradually becoming subdivided into three categories: (1) branded online self-owned platforms: brand manufacturers set up official stores in the form of E-commerce platform to achieve direct access to the official store to sell corporate products to front-line customers, and it is also necessary to pay a specific percentage of the order fee to the platform. The brand manufacturers control the pricing power of goods. Examples include IKEA, Nitori, Herman, Universal Furniture, *etc.* (2) The brand stationed in the integrated E-commerce platform: this model is the E-commerce platform from the brand factory to buy goods, where there is selling on the platform, with the right to decide the price of products to achieve the platform self-owned sales, such as Amazon, AliExpress, e Bay, Tmall, Suning, *etc.* (3) Third-party agents sales E-commerce platform: this method is a third-party merchant into the e-commerce platform and set up stores, from the brand manufacturers to buy goods and thus through the store to sell goods. There is still the same need to pay a specific percentage of the order fee to the platform and possess the right to determine the selling price of goods, such as My Home Furniture Purchase APP (Guan 2021).

With increased sales, new problems arise. In the literature on “consumers buying online furniture” that were reviewed in the big data search engines of CNKI and WOS, a large number of articles show that consumers have chosen online furniture platforms to decide whether to purchase, *e.g.*, in the literature report on online furniture purchasing behavior, some studies focus on the effects of gender, age, income, and other variables on those who have chosen to buy (Li *et al.* 2012) and the analysis of consumer populations

more influenced by the segmented group's intention to have bought (Hakala *et al.* 2015; Medeiros *et al.* 2016). However, the literature on which factors influence buyers' choice of online platforms is scarce, and consumers are faced with the intricacies of furniture E-commerce platforms and online furniture. When facing the intricate furniture E-commerce platforms and online furniture products, they often have difficulties in purchasing and hesitation in choosing, *etc.* In this regard, to help furniture E-commerce platforms and furniture enterprises better understand consumers' consumption demand for online furniture, this paper uses Analytic Hierarchy Process (AHP) to construct an index system to systematically study the influencing factors of online furniture consumption and provide scientific references for the optimization of furniture E-commerce business models, furniture E-commerce platforms, and online furniture product development.

The structure of this paper is as follows. Firstly, the preamble background of this paper and the research method is introduced, and the system framework of AHP is determined by the Delphi method. Secondly, it uses questionnaires of experts to collect data. The ranking of weights is also used to provide rigorous data support for the paper. Moreover, optimal suggestions are made based on the framework. Finally, the paper summarizes the conclusions drawn from the review and provides suggestions for further research.

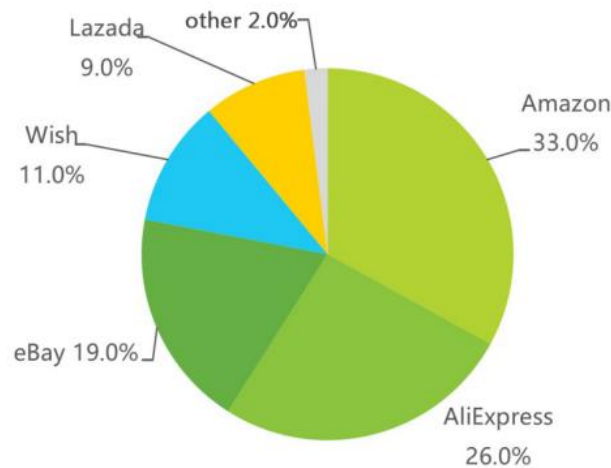


Fig. 1. Share of each e-commerce furniture sales platform in the German Statista database in 2020 (Federal Statistical Office 2020 database)

ONLINE FURNITURE CONSUMPTION INFLUENCE FACTORS INDICATORS

Online Furniture Basic Characteristics

The basic consumer procedure for online furniture is as follows: the consumer uses the platform to place orders, the E-commerce platform is used to take orders, factories supply the furniture, brand warehouses handle delivery, logistics must be coordinated, and after-sales service is needed. Its main characteristics are heavy furniture mass, difficulty to transport, high cost, a wide range of furniture, a wide choice with the possibility of providing individual customization, ease of operation, *etc.* Therefore, the problems based on the correct handling of the above characteristics have also become an important indicator for consumers to consider whether to have online furniture purchase or not (Li *et al.* 2020; Zhang *et al.* 2022).

Consumption Influence Factor Index Determination Method

The establishment of the online furniture consumption influence factor index system is the prerequisite for this paper’s research. Firstly, the content of online furniture consumption influence factors was comprehensively sorted out through the literature research method, and then the basic index system framework was derived from the analysis of the five purchase factors of potential furniture buyers due to the need identification, information search, alternative evaluation, purchase decision, and post-purchase behaviour by the relevant researchers using the hierarchical analysis method (Oblak *et al.* 2017). Then the Delphi method was used to collect experts’ opinions and determine the basic indicators (Brady 2015) to understand the basic situation of online purchasing platforms and the constituent factors of online item purchase (Wang 2014; Chen *et al.* 2022). A further goal was to understand how online and offline consumption will be influenced by its related factors, leading to different choice results (Wieland 2021). The research results were eventually summarized and adjusted according to the literature on the online furniture market (Zhao 2016; Li 2022; Wang and Yang 2022) and the current state of buying by re-planning the influencing factors and using the indicator system of the existing literature as a reference. In this paper, expert users should be sought from marketers, business people, and consumers to make the research results accurate and objective. To summarize the viewpoint the authors interviewed 10 professionals, including 3 people with online furniture sales experience, 2 people from online furniture manufacturing companies, and 5 experienced consumers of online furniture (Table 1).

Table 1. Expert Knowledge Areas

Expert Population	Specialist Areas
Experienced personnel of online furniture sales	Sales, E-commerce platforms, furniture brands, after-sales service, logistics services
Manufacturing personnel of online furniture sales	Furniture manufacturing process, furniture materials, corporate requirements, automated operations
Veteran consumers of online furniture sales	Freelance, aging researcher, furniture enthusiast, designer



Fig. 2. Competency distribution of the three types of professionals

Subject to the interplay between producer-seller-consumer (Purcarea *et al.* 2010), relevant integrated areas were identified for the 10 experts, and Fig. 2 shows the distribution of competencies in each category, reflecting their research directions in different areas and their relevant strengths.

Judgment Index Establishment

The above method resulted in 3 Primary Indicators: Personal Factor, Product Factor, and Service Factor; 16 Secondary Indicators: Personality Traits, Revenue, Occupation, Personal Preferences, Furniture Price, Furniture Quality, Furniture Material, Furniture Size, Types of furniture, Furniture Brand, Merchant Credibility, Web Factor, Convenience Factor, Payment Factors, Logistics Factors, and After-sales Factors. The details are shown in Table 2.

Table 2. Judgment Index Establishment

Primary Indicators	Secondary Indicators
Personal Factors	Personality Traits: Refers to the consumer's personality, psychological characteristics, emotional needs, physical characteristics, <i>etc.</i>
	Revenue: Refers to the consumer's income.
	Occupation: Refers to the consumer's occupational requirements, such as a heavy workload that prevents them from taking time off to make purchases.
	Personal preference: Refers to personal preference needs.
Product Factors	Furniture prices: Refers to the price of the furniture.
	Furniture quality: Refers to the quality of the furniture, the quality of the furniture.
	Furniture materials: Refers to the material of the furniture, <i>e.g.</i> wood plywood, <i>etc.</i>
	Furniture size: Refers to the size of the furniture, <i>e.g.</i> adult furniture, children's furniture, <i>etc.</i>
	Types of furniture: Refers to the different styles of furniture, <i>e.g.</i> minimalist, luxury, <i>etc.</i>
	Furniture brands: Refers to different brands of furniture.
Service Factors	Merchant Credibility: Refers to the priority consumers give to checking a merchant's reputation points before making a purchase.
	Web Factor: Refers to the fact that consumers are influenced by web pages to choose to buy online.
	Convenience Factor: Refers to the convenience of online shopping.
	Payment Factors: Refers to the payment method of online shopping, such as app payment, credit card payment, <i>etc.</i>
	Logistics Factors: The speed of logistics, the service of logistics, <i>etc.</i>
	After-sales factors: The after-sales service provided after the purchase of furniture.

METHOD

The Analytic Hierarchy Process (AHP), proposed by American operations researcher T. L. Saaty of the University of Pittsburgh in the early 1970s, is a simple, flexible,

and practical multi-criteria decision-making method for quantitative analysis of qualitative problems (Vaidya *et al.* 2006). Its main features are a balanced interpretation from many problems (Khaira and Dwivedi 2018), a comprehensive overview of the problem by considering all appropriate criteria and treating the object of study as a system. This is done in accordance with decomposition, comparative judgement, and synthesis of the way of thinking for decision-making. This is becoming an important tool for systems analysis developed after mechanistic analysis and statistical analysis. Secondly, this approach neither pursues mere mathematics nor focuses one-sidedly on behaviour, logic and reasoning, but organically combines qualitative and quantitative methods to decompose complex systems, making the results simple and clear and easily understood and grasped by the reader. Finally, this idea is able to deal with many practical problems that cannot be approached with traditional optimization techniques, and it is a more effective way of modelling the brain's decision-making process. The approach is illustrated in a flowchart (Fig. 3).

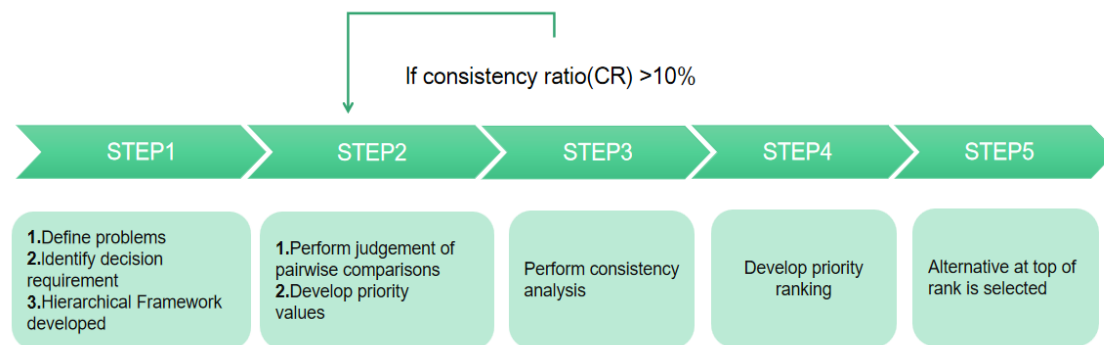


Fig. 3. The AHP flow chart

The AHP method has been widely used in the areas of timber, furniture, sales, and online shopping. For example, Kaushik used this method for identification analysis in his study of online fashion retailing in India to identify factors that influence consumer preference for online fashion retailers (OFR) (Kaushik *et al.* 2020). Yilmaz also used the AHP method when considering the ranking order of consumer-preferred shopping sites to determine the weighting factors that influence consumers' choice of website (Yilmaz 2022). Ojurovic analyzed the key factors of competitiveness in wood processing and furniture production (Ojurovic *et al.* 2013). Singer proposed an interval Pythagorean fuzzy AHP hierarchical process model to prioritize the key factors influencing the choice of wooden outdoor furniture (Singer *et al.* 2022). Wang in his research on the evaluation indicators of parent-child interactive game furniture design, used this method to carry out quantitative analysis to rank their weights and summarize the design strengths and weaknesses of the relevant products for further optimization (Wang and Pan 2022). Based on this, this method can also be cited for research in this paper.

Constructing a Hierarchical Structure Model

According to the online furniture consumption influence factors index, an AHP hierarchical structure model was constructed: the top layer (Target Layer) is the online furniture consumption decision-making behavior, and the middle layer is the Criterion Layer and Sub-criterion Layer. The Criterion Layer contains Personal Factors, Product

Factors, and Service Factors, which are the three main factors influencing consumers' online furniture purchasing decision-making behavior; the Sub-criteria Layer further classifies Personal Factors into Personality Characteristics, Revenue, Occupation, and Personal Preferences. Product Factors are further classified into Furniture Price, Furniture Quality, Furniture Material, Furniture Size, Furniture Type, and Furniture Brand. The Service Factors are further divided into Merchant Credibility, Web Page factor, Convenience Factor, Payment Factor, Logistics Factor, and After-sales Factor. The details are shown in Fig. 4.

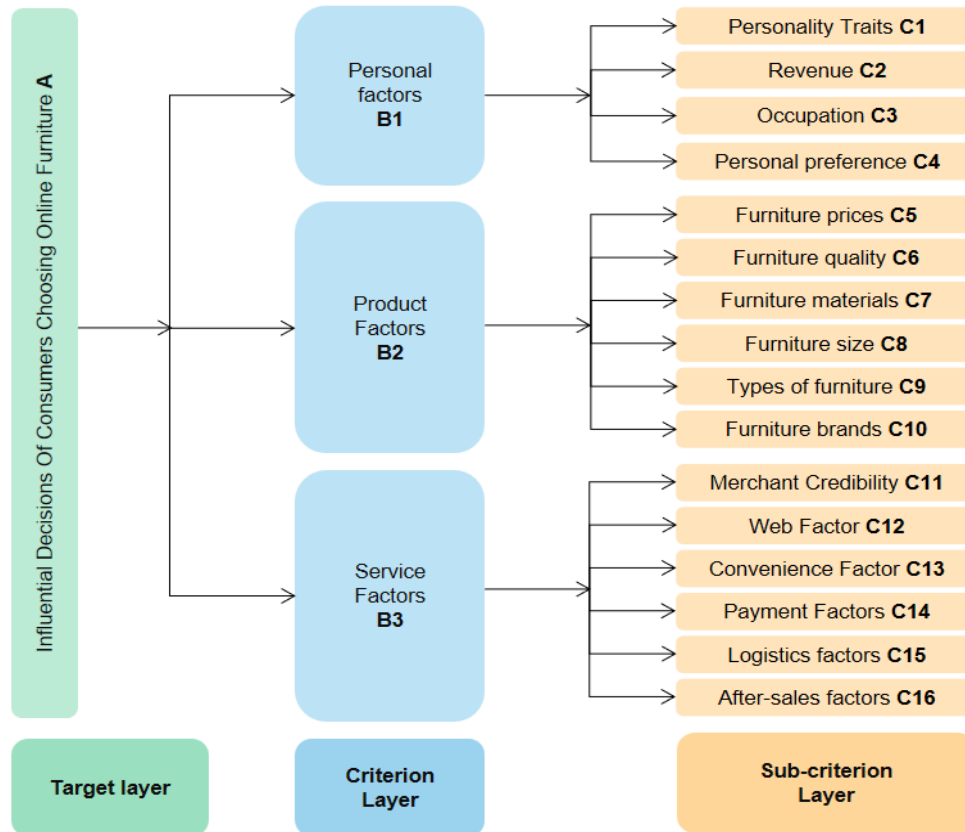


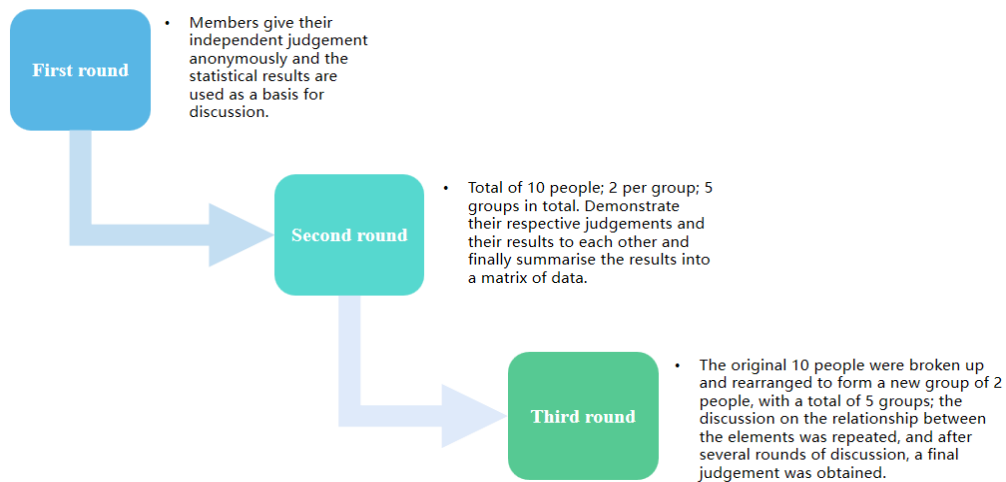
Fig. 4. Hierarchical analysis model of consumer influence decision

Construction of Judgment Matrix

The construction of the judgment matrix is the information basis of the AHP model approach. Assuming that each vector element in the judgment matrix is a_{ij} and $a_{ij} > 0$, then a_{ij} indicates the importance of the indicator a_i to a_j , and if compared backward, the result is $1/a_{ij}$ ($ij=1,2, \dots n$), where n is the order of the judgment matrix. A web-based questionnaire was used to evaluate "What Factors Influence Consumers' choice of Online Furniture", and 10 people involved in online furniture were used as experts to quantify the scale and conduct a questionnaire survey on the judgment matrix of each level of indicators (scoring criteria: Table 3). The process is shown in Fig. 5.

Table 3. Judgment Matrix Scales

Scale	Level of Importance
1	<i>i, j</i> elements are equally important
3	<i>i</i> is slightly more important than <i>j</i>
5	<i>i</i> is significantly more important than <i>j</i>
7	<i>i</i> is strongly more important than <i>j</i>
9	<i>i</i> is definitely more important than <i>j</i>
2, 4, 6, 8	Intermediate values
Inverse of scale	If the ratio of the importance of element <i>i</i> to element <i>j</i> is a_{ij} , then the ratio of the importance of element <i>j</i> to element <i>i</i> is $1/a_{ij}$

**Fig. 5.** Flowchart of the Delphi Method

Hierarchical Ranking and Its Consistency Test

According to the evaluation scale in Table 3, a judgment matrix is constructed, and this subject is assigned to 10 experts, and two-by-two comparisons are made at each level. The calculation steps are as follows.

1. Calculate the product of the elements of each row of the judgment matrix A , calculated as in equation (1).

$$M_i = \prod_{j=1}^n a_{ij}, i=1, 2, \dots, n \quad (1)$$

2. Calculate the n root of M_i , calculated as in equation (2).

$$\bar{\omega}_i = \sqrt[n]{M_i} \quad (2)$$

3. Normalized to $\bar{\omega}_i$ for ω_i and ω_i is the maximum eigenvalue, calculated as in equation (3).

$$\omega_i = \frac{\omega_i}{\sum_{j=1}^n \omega_j} \quad (3)$$

4. To calculate the maximum eigenvalue see Eq. 4,

$$\lambda_{max} = \sum \frac{(A\omega)_i}{N\omega_i} \tag{4}$$

where λ_{max} is the maximum eigenvalue; A is the matrix A multiplied by the phase; i is the relative weight; N is the order of the matrix.

5. The consistency index is shown in Eq. 5, and the consistency ratio is shown in Eq. 6,

$$CI = \frac{\lambda_{max} - N}{N - 1} \tag{5}$$

$$CR = \frac{CI}{RI} \tag{6}$$

where CI is the consistency index; RI is the random consistency index; CR is the consistency ratio. The weights of each index are shown in Tables 5 through 8.

The closer λ_{max} is to N , the more consistent the CI is, and the smaller the judgment error derived, and when the matrix judgment $CR < 0.1$, the judgment matrix is considered to have satisfactory consistency. The consistency test results are shown in Table 4.

Table 4. Consistency Test RI chart

Matrix Order	1	2	3	4	5	6	7	8	9	10	11	12
RI	0	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49	1.52	1.54

Table 5. Judgment Matrix of the Influence of the Criterion Level Factors on the Target Level

A	B1	B2	B3	Weight (ω_i)	λ_{max}	CR
B1	1	1	2	0.387302	3.0182	0.0175
B2	1	1	3	0.442857		
B3	1/2	1/3	1	0.169841		

Table 6. Judgment Matrix of the Impact of Sub-Criterion Layers (C1 through C4) on Individual Factor B1

B1	C1	C2	C3	C4	Weight (ω_i)	λ_{max}	CR
C1	1	1/3	1	4	0.221306	4.1241	0.0464
C2	3	1	3	4	0.497250		
C3	1	1/3	1	3	0.200472		
C4	1/4	1/4	1/3	1	0.080971		

Table 7. Judgment Matrix of the Influence of Sub-Criteria Layers (C5 through C10) on Product Factor B2

B2	C5	C6	C7	C8	C9	C10	Weight (ω_i)	λ_{max}	CR
C5	1	1/2	3	5	5	3	0.362728	6.2912	0.0462
C6	1/2	1	3	4	3	2	0.239343		
C7	1/3	1/3	1	3	1	2	0.131677		
C8	1/5	1/4	1/3	1	1/2	1/3	0.050552		
C9	1/5	1/3	1	2	1	1/3	0.081708		
C10	1/3	1/2	1/2	3	3	1	0.133992		

Table 8. Judgment Matrix of the Impact of Sub-Criteria Layers (C11 through C16) on Service Factor B3

B3	C11	C12	C13	C14	C15	C16	Weight(ω_i)	λ_{max}	CR
C11	1	3	2	5	5	2	0.348479	6.3291	0.0524
C12	1/3	1	1/2	4	2	3	0.174330		
C13	1/2	2	1	5	2	2	0.214883		
C14	1/5	1/4	1/5	1	1/3	1/5	0.040941		
C15	1/5	1/2	1/2	3	1	1	0.096300		
C16	1/2	1/3	1/2	5	1	1	0.125115		

From this, it can be seen that the *CR* values of the indicators at all levels in Tables from 5 to 8 are less than 0.1, the matrices can all pass the consistency test, the weights have a high degree of confidence, and the data are more accurate and do not need to be readjusted.

INDICATOR MODEL DATA BUILDING

Table 9. Final Rating Scale for Consumers Choosing Online Furniture

Criterion Layer			Sub-criterion layer			Total Weight	Total Sort
Evaluation Indicators	Relative Weights	Sort By	Evaluation Indicators	Relative Weights	Sort By		
Product Factors	0.4428	1	Furniture prices	0.3627	1	0.1606	2
			Furniture quality	0.2393	2	0.1059	3
			Furniture brands	0.1339	3	0.0593	6
			Furniture materials	0.1316	4	0.0583	8
			Types of furniture	0.0817	5	0.0361	10
			Furniture size	0.0505	6	0.0223	13
Personal factors	0.3873	2	Revenue	0.4972	1	0.1925	1
			Personality Traits	0.2213	2	0.0857	4
			Occupation	0.2004	3	0.0776	5
			Personal preference	0.0809	4	0.0313	11
Service Factors	0.1698	3	Merchant Credibility	0.3484	1	0.0591	7
			Convenience Factor	0.2148	2	0.0364	9
			Web Factor	0.1743	3	0.0296	12
			After-sales factors	0.1251	4	0.0212	14
			Logistics factors	0.0963	5	0.0163	15
			Payment Factors	0.0409	6	0.0069	16

Based on the above calculations, the weight values, λ_{max} values, and CR values for each indicator factor at the criterion level are derived and the indicators meet the consistency test criteria. The above results were collated, and all indicators were ranked in terms of their weights, and the final rating scale model of factors influencing consumers' choice of online furniture is shown in Table 9.

TESTING

Grey Forecasting Method (G,M) is a method of predicting grey systems. Grey Forecasting models are effective for predicting small numbers of data series with low completeness and reliability, using differential equations to fully exploit the nature of the data to predict future trends and therefore meet the criteria for testing the data (Xie and Liu 2009). The previous AHP analysis shows that the most important factors influencing consumers' choice of online furniture are the price of furniture, income, and quality of furniture and that consumers are more likely to be influenced by price and choose online platforms for shopping. Therefore, this grey prediction model will combine the results of the data to justify the AHP model, taking "Gujia Online Furniture" as an example, to predict whether the price of furniture is one of the main factors for consumers to choose the online platform to buy furniture, based on the relationship between the change of residential furniture sales and the price fluctuation. The sales situation between October 30, 2022, and November 12, 2022, was obtained from "Know Tao Data", as shown in Fig. 6.



Fig. 6. Sales figures for the residential furniture category

Test Results

To exclude the interference of the month-end event and the "Double 11" event, this study intercepted the online furniture sales data from November 2, 2022, to November 5, 2022, and forecasted the daily sales and prices of residential furniture from November 6, 2022, to November 8, 2022, using the grey forecasting model GM(1,1) algorithm in

SPASSPRO software. From Fig. 7, it is possible to build a grey model of sales from November 2, 2022, to November 8, 2022, where the unit price of bed furniture is listed as [1332, 1332, 1332, 699, 599, 598] (*unit: ¥*), and the sales on that day are [50, 100, 150, 200, 250] (*unit: pieces*), based on the forecast of historical period data, we can know that in November. Therefore, when the price of a single product increases, the sales volume of that day will decrease. Alternatively, when the price of a single product starts to fall, the sales volume of that day will increase positively. It can be inferred from this that when consumers shop for furniture online, they will be influenced by the price of the furniture to choose to buy. This conclusion is in line with the conclusion drawn from the AHP model and has a certain test effect on this study.

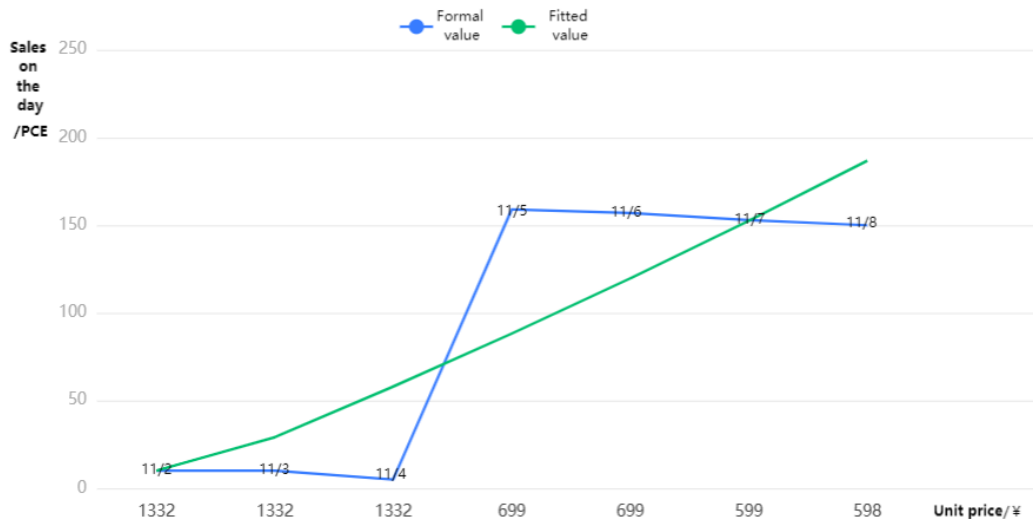


Fig. 7. Residential furniture forecast sales chart

RESULTS AND DISCUSSION

This study focuses on the collection of Internet online furniture sales data after 2020 and the investigation of online furniture markets around the world in the context of the AHP and Grey Prediction Model combination. It considers the objective factors affecting consumers' choice of online furniture, and subjective factors for streamlining and refining, through refinement and stratification to determine the hierarchical indicators between the elements. The AHP method is used to model and analyze the weights between the elements, and then the Grey prediction model is used to test the results.

Among the three Primary Indicators that influence consumers' choice of online furniture, the Product Factor was found to have the highest target weight among the three factors. It was followed by the Personal Factor with the second highest weight; and finally the Service Factor had the least influence among the other factors. This shows that consumers at different stages of choosing online furniture are more likely to focus on the product factor of the furniture, and the demand for its use and function still dominates, which is largely in line with the findings of the popular psychology (Lihra *et al.* 2012). However, due to the large size of the furniture itself and the high transport costs,

manufacturers should be more stringent in their own manufacturing requirements, innovative, and optimized in terms of materials, size and style, such as the use of new technologies in furniture manufacturing to reduce the production of large mass objects; the use of modular and series design in furniture styles to facilitate disassembly and transport; and the increase of sensory technology (such as VR technology, *etc.*) in online displays, thus bring new product experiences to consumers and promote shopping enthusiasm to drive the online furniture market. According to the 16 Secondary Indicators of the factors influencing consumers' choice of furniture online, the factors in descending order of influence are Revenue, Furniture price, Furniture quality, Personality Traits, Occupation, Furniture brand, Merchant Credibility, Furniture material, Convenience Factor, Types of furniture, Personal preference, Web Factor, Furniture size, After-sales Factor, Logistics Factor, and Payment Factor. From the Revenue situation and Furniture price, it is known that consumers will prioritize their own consumption level while pursuing the quality of furniture online, and they will not ignore the price because of the outstanding quality of furniture. This can be achieved by making relative policies on price to attract purchases and increase sales, such as using their price incentives to launch other peripheral products to stimulate consumers' potential desires or increasing online furniture membership mechanisms to provide better prices and better service to discover long-term users. Price information can also be visualized to attract consumers' attention and increase the likelihood of purchase. The relationship between the Furniture quality and the Furniture prices shows that most consumers not only value the price of furniture, but also the quality of the product, so low prices, and high-quality products are favored by customers. In addition to this, Personality Traits and Occupation are prominent in the top-weighted factors. It can be understood that some consumers may choose to shop online because of their personalities, such as social fears and love of web surfing. In terms of service factors, a good service system is also the core driver of an industry's development, so it is important to pay more attention to the quality of after-sales service while ensuring credibility, and the attitude of online service is particularly important. In addition, a more efficient delivery experience, more convenient and fast payment methods, and more attractive advertising slogans will likely enhance the online furniture shopping experience and thus enhance sales.

CONCLUSIONS

1. This paper uses the analytic hierarchy process (AHP) to analyze the weighting of factors influencing online furniture consumption at three levels: Target level, Criterion level, and Sub-criterion level; and then it uses a Grey Prediction Model to validate the results obtained from the AHP method, which can ultimately reduce the anxiety and difficulties arising from the problem of choosing online furniture for consumers, enhance the advantages of online furniture itself, and provide an important reference basis for other online furniture product development and marketing promotion.
2. In the model of online furniture consumption factors, the Product Factor is the most influential factor in consumers' purchasing decisions on online furniture platforms, with a maximum weight of 0.4428; followed by the Personal Factor with a weight of 0.3573; and the Service Factor with the least weight of 0.1698.

3. In the secondary indicators, the highest weight of 0.4972 is given to Revenue; the second highest weight of 0.3627 is given to Furniture Price and 0.3484 to Merchant Credibility; and the lowest weight of 0.0409 is given to payment factor.
4. Through the comprehensive evaluation analysis of indicators at all levels, the total ranking of the 16 influencing factors in the Secondary Indicators, Revenue accounts for the largest proportion, with a weight value of 0.1925; followed by Furniture Price, with a weight of 0.1606; and finally Furniture Quality, with a weight of 0.1059. The above three factors have the greatest impact on consumers' choice of online furniture. In contrast, the After-sales Factor, Logistics Factor, and Payment Factor have lower relative weights on the total target at 0.0212, 0.0163, and 0.0069, respectively.
5. The Grey Prediction Model was used to test the model of factors influencing consumer choice of online furniture and it was found that changes in online prices would lead to changes in product sales and that consumers would choose online platforms to purchase furniture because of the price of furniture. Therefore, it was consistent with the AHP model data influencing consumer choice of online furniture and the conclusion was successfully argued.

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