Model Construction of Service Influencing Factors in Optometry Industry Based on Service Design

Zhe Li[1a], Jie Gao[2*]

[12]School of Art and Design Beijing Institute of Fashion Technology Beijing, China
[a]Jsyliz@bift.edu.cn
*120839127@qq.com

Abstract

[Objective] To build a service design model for the ophthalmology and optometry industry to solve the problems of low consumer satisfaction with service experience and the mismatch between market service entities and consumers' service needs during the post-epidemic period, so as to transform the industry service entities and upgrade service content. Provide research basis and improvement ideas. [Methods] Based on the related methods of service design and consumer satisfaction, construct a model of influencing factors to solve current industry problems, collect sample data through questionnaires, and use structural equation model to conduct empirical analysis to verify the validity of the model. [Results] It is concluded that professional and technical satisfaction has a positive impact on service experience satisfaction; Professional and technical satisfaction has a positive impact on service efficiency satisfaction; Service efficiency satisfaction has a positive impact on service experience satisfaction; Service efficiency satisfaction plays a mediating role between professional and technical satisfaction and service experience satisfaction; Problem cognition has a mediating moderating effect on the relationship between professional and technical satisfaction and service efficiency satisfaction.[Conclusion] The feasibility and rationality of the service design method and the influencing factor model constructed by the theory in the application of the ophthalmology and optometry industry are verified through data analysis.

***Keywords**- post-pandemic period; Ophthalmology industry; Service design; Service Impact Factor Model*

1. INTRODUCTION

This article attempts to propose a service design model for the optometry industry in the civilian eye lifestyle in the post-epidemic period. Specifically, this research will use the service design method to extract the dimensions of the influencing factors of the model, and then construct a moderated mediation model, with service experience satisfaction as the independent variable, service efficiency satisfaction as the mediating variable, and professional technology Satisfaction is the dependent variable, and consumers' perception of vision problems is introduced as a moderating variable on the me-diating path of consumer efficiency service satisfaction. Linear regression and structural equation modeling are used for data analysis and empirical testing. The research results will help the optometry industry to solve the problems exposed by the current industry service experience and consumer touchpoints, and provide research basis and improvement ideas for the transformation of industry service entities and the upgrading of service content.

2. APPLICATION RESEARCH OF SERVICE DESIGN IN OPHTHALMOLOGY INDUSTRY

A visual map in service design is a visualization of stakeholder information to extract corresponding design knowledge. KALBACH proposed user experience map, customer journey map and service blueprint, which have been widely used in service design as representative visualization tools [10].These visualization tools visually present the con-tact points in the service project system, clarify the pain points to be improved and optimized in the service system and reveal the innovation opportunity points in the project system, which can deepen the in-depth understanding and demand mining of the real needs of stakeholders , to better carry out service design optimization system.

According to the research needs of this paper, the user needs, pain points and opportunity points of the service experience in the optometry industry are researched through the user experience map of service design. In this paper, the user experience map in the service design visualization map is targeted and innovative and improved according to the service characteristics of the optometry industry. Through industry inspection and in-depth interviews, we learned that the main service entities in this industry are hospitals and traditional optical shops. Therefore, the drawing of the user experience map is subdivided into two service entity type modules. The curve" module is compared, and it is concluded that the two types of service entities in the current industry cannot solve the core problem of user service experience satisfaction. At the same time, empirical research is carried out to extract the research dimensions of the demand point and opportunity point modules, so as to carry out objective data analysis and empirical research to confirm the authenticity of the research and provide support for the research process.

3. MODEL CONSTRUCTION OF SERVICE INFLUENCING FACTORS IN THE OPTOMETRY INDUSTRY

3.1. Model establishment and verification

Through the service design user experience map, the service needs of users in the optometry industry are excavated, so as to sort out the demand points that urgently need to be optimized for the current industry service experience, and then condense the problems to obtain the opportunity points, and thus obtain the service requirements for the optometry industry. The dimensions and directions of further empirical research will focus on the four dimensions of "awareness of vision problems", "service efficiency satisfaction", "service experience satisfaction" and "professional technical satisfaction" for the service process of the optometry industry. The impact structure is empirically analyzed, and the model construction and research assumptions are as follows Figure 1.
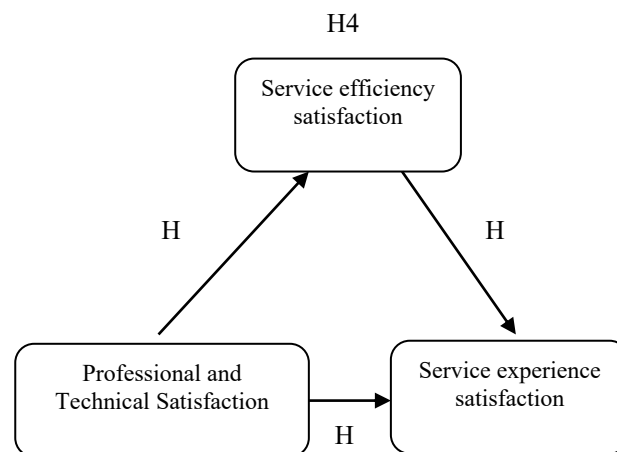

Figure1. Schematic diagram of model building

Assumption 1 (H1): Professional and technical satisfaction has a positive impact on service experience satisfaction

Assumption 2 (H2): Professional and technical satisfaction has a positive impact on service efficiency satisfaction

Assumption 3 (H3): Service efficiency satisfaction has a positive impact on service experience satisfaction

Assumption 4 (H4): Service efficiency satisfaction plays a mediating role in professional and technical satisfaction and service experience satisfaction.

3.2. Data collection

The youth service groups and their parents in the optometry industry are the main consumer groups in the industry. They have certain consumer demand in the

optometry industry and knowledge reserves related to vision health, so it has strong practical significance as a research entry point. Therefore, this paper will take consumers in the optometry industry as the main research object. In the actual investigation, according to the principle of proximity, select consumers in the optometry industry who have had consumption behaviors in traditional Chinese medicine hospitals, traditional optical shops, and optometry centers to conduct questionnaire surveys. data collection. For the target consumer group, this paper will study the relationship between the variables of consumer experience satisfaction, professional and technical satisfaction, service efficiency satisfaction, and awareness of vision problems.

In this study, a total of 430 questionnaires were distributed, and 399 valid questionnaires were recovered. After the questionnaire was collected, the relevant

information data were sorted and analyzed, and the analysis process was as follows.

3.3. Reliability and validity test

3.3.1. Reliability

The reliability of the sample data was tested by reliability analysis. Cronbach's Alpha coefficient is an important indicator to measure the reliability. If its coefficient is >0.9, it indicates that the reliability of the questionnaire is very high, which means that the collected questionnaire data is true and reliable; If the coefficient is between 0.7 and 0.9, it means that the reliability of the questionnaire is high, and the questionnaire data can be retained. In this paper, SPSS 23.0 was used to test the reliability of each scale, and the results are shown in Table 1.

TABLE 1.   RELIABILITY TEST

dimension	number of items on the scale	Reliability Cronbach'α
experience satisfaction	6	0.772
Professional and Technical Satisfaction	8	0.736
Service efficiency satisfaction	6	0.922
problem awareness	5	0.894

It can be seen from the above table that the reliability coefficient Cronbach's α value of the experience satisfaction scale in the data is 0.772, the reliability coefficient Cronbach's α value of the professional and technical satisfaction scale is 0.736, and the reliability coefficient Cronbach's α value of the service efficiency satisfaction scale is 0.736. 0.922, the reliability coefficient Cronbach's α value of the problem cognition

scale is 0.894, and the Cronbach's α value of each variable is greater than 0.7, which indicates that the reliability of the data in this study is of good quality. In summary, the reliability of the scale meets the reliability quality requirements.

3.3.2. Validity

This paper mainly uses the corresponding statistical analysis software for validity analysis. First, use SPSS23.0 for exploratory factor analysis. The first step is to perform KMO and Bartlett sphericity tests. On the basis of the sample data meeting the corresponding standards, the second step uses principal component analysis and factor rotation to extract eigenvalues greater than 1 and factors with factor loading coefficients greater than 0.5 require that the cumulative variance explanation rate of each variable is greater than 60%.

KMO and Bartlett sphericity tests. Before conducting exploratory factor analysis, this paper firstly conducts KMO and Bartlett sphericity tests on the total scale formed by variables such as experience satisfaction, professional and technical satisfaction, service efficiency satisfaction, and problem awareness. The specific results are shown in Table 2. The KMO coefficients are 0.736, 0.752, 0.869, 0.881 in turn, and the Bartlett sphericity test significance coefficient is 0.000, which has reached the validity standard, and it can be seen that the sample data is suitable for factor analysis.

In this paper, the principal component analysis method is used to extract the principal components of the variables, and the orthogonal rotation is used to maximize the variance, and the extraction standard is that the eigenvalue is greater than 1. The analysis results in Table 3 show that a common factor is extracted from the scale of each variable, and the cumulative variance explanation rate of each variable is greater than 60%, which reflects the reasonable dimension design of the scale. The values are all greater than 0.6 (see Table 3), indicating that the scale has good validity.

TABLE 2.   PRE-INVESTIGATION VALIDITY CHECK RESULTS

variable		experience satisfaction	Professional and Technical Satisfaction	Service efficiency satisfaction	problem awareness
KMO Sampling Suitability Quantity average value		0.736	0.752	0.869	0.881
Bartlett's test for sphericity	approximate chi-square	1659.163	1498.313	1856.094	1103.187
	Df (degrees of freedom)	15	28	15	10
	Significance	0.000	0.000	0.000	0.000

TABLE 3.   PRE-INVESTIGATION VALIDITY CHECK RESULTS

variable	heading	ingredients	Cumulative variance explained rate
experience satisfaction	The person in charge of the eye examination in the hospital can be kind, considerate and considerate for me.	0.918	84.277%
	Medical staff can disinfect equipment and hands in a timely manner when checking eye and vision problems for each patient, and pay attention to hygiene to avoid cross-infection.	0.953	
	The environment for the vision examination in the hospital is clean and comfortable and makes you feel comfortable and relaxed.	0.930	
	The optometrist can be kind, considerate and considerate for you during the visual inspection.	0.875	
	Optometrists can disinfect equipment and hands in time when checking vision problems for each customer, and pay attention to hygiene to avoid cross-infection.	0.923	
	The environment for your vision checks in the optical shop is clean and comfortable and makes you feel comfortable and relaxed.	0.895	
Professional and Technical Satisfaction	The diagnosis and treatment plan issued by the doctor for you is accurate and effective.	0.728	68.027%
	Doctors are skilled and reliable when treating you with professional skills.	0.769	
	Doctors can handle a variety of complex cases and give you a customized diagnosis and treatment plan.	0.831	
	The treatment process is professional and well-arranged.	0.726	
	Optometrists are accurate and effective in checking your vision and fitting your glasses.	0.861	
	Optometrists are skilled and reliable when checking your vision.	0.858	
	Optometrists can accurately judge and deal with various complex vision problems, and provide customized products or solutions according to your needs.	0.885	
	The visual inspection process of the optical shop is professional and standardized and the arrangement is reasonable.	0.668	
Service efficiency satisfaction	You think the length of waiting you have in the past for hospital visits was necessary and reasonable.	0.892	73.798%
	You think your waiting time at your clinic visit is efficient and reasonable.	0.897	
	You think the examination items arranged by your doctor are necessary and efficient.	0.832	
	Do you think the waiting time for your eye exam at an optical store in the past is necessary and efficient?	0.797	
	You consider your time at the optical shop eye exam to be efficient and conscientiously necessary.	0.870	
	You think that the vision examination items arranged by the optical shop for you are sufficient and necessary.	0.862	
problem	I think regular eye exams should be done every 6 months.	0.796	70.347%

awareness	I am aware of pseudo myopia in adolescents and effective interventions are available at this stage.	0.859
	I am very aware of the current health problems with my eyes.	0.819
	I know more than three effective methods to intervene in pseudo-myopia (such as vision training, OK mirrors, myopia prevention and control lenses, etc.).	0.867
	I know very well what eye health problems can be caused by bad habits in daily life (such as lying down and reading, watching TV in a dark environment, eating too much sugar, etc.).	0.850

3.4. Difference test

At present, consumers choose vision screening methods mainly in hospitals and traditional optical shops. In order to test whether there are differences in consumers' experience satisfaction, professional technical satisfaction and service efficiency satisfaction in the process of vision screening between hospitals and traditional optical shops, this study used independent samples T-test to conduct analyze. The results are shown in the following Table 4. There are significant differences in consumers' satisfaction with vision screening between hospitals and traditional optical shops. Specifically: In terms of experience satisfaction, consumers' experience satisfaction in hospital vision screening (M=3.922) is significantly lower than that of traditional optical shops (M=4.061), and the t value is -2.319, the absolute value is greater than 1.96, and the p value is significant. is 0.021 less than 0.05;In terms of professional and technical satisfaction, the hospital (M=3.677) is significantly higher than the traditional optical shop (M=3.375), and the t value is 6.979, the absolute value is greater than 1.96, and the significant p value is less than 0.05;In terms of service efficiency satisfaction, the hospital (M=3.192) was significantly lower than the traditional optical shop (M=4.120), and the t value was -12.986, the absolute value was greater than 1.96, and the significant p value was less than 0.05.

3.5. Correlation test

Correlation analysis can test whether there is a correlation between the variables, and the existence of the corresponding correlation is the basis for the follow-up study of the influence of each variable. This paper uses SPSS23.0 soft-ware to analyze the correlation between variables, and uses the Pearson coefficient to test the correlation between variables. If the correlation between variables is significant, it indicates that each variable has an interaction effect. Generally speaking, correlation analysis can only judge the correlation and degree of correlation between variables, but the difference between independent variables and dependent variables. Table 5 summarizes the meaning that Standard deviation and correlation coefficient.

TABLE 4. DIFFERENCE TEST RESULTS OF DIFFERENT DIMENSIONS IN HOSPITALS AND TRADITIONAL OPTICAL SHOPS

variable		average value	standard deviation	t	p
Service experience satisfaction	Hospital	3.922	0.956	-2.319	0.021
	traditional optical shop	4.061	0.728		
Professional and Technical Satisfaction	Hospital	3.677	0.526	6.979	<0.001
	traditional optical shop	3.375	0.684		
Service efficiency satisfaction	Hospital	3.192	1.175	-12.986	<0.001
	traditional optical shop	4.120	0.811		

TABLE 5. MEAN, STANDARD DEVIATION, AND CORRELATION FOR EACH VARIABLE

	experience satisfaction	Professional and Technical Satisfaction	Service efficiency satisfaction	problem awareness
experience satisfaction	1			
Professional and Technical Satisfaction	.637***	1		
Service efficiency satisfaction	.482***	.511***	1	
problem awareness	-.138**	-.169**	-.171**	1
average value	3.991	3.526	3.656	1.955
standard deviation	0.631	0.441	0.975	0.753

Tips: ***Denotes p<0.001; **Denotes p<0.01

The results show that the correlation coefficients of professional and technical satisfaction, service efficiency satisfaction and experience satisfaction of

consumers in ophthalmology-related services are 0.482 and 0.511 respectively, and the significance of p<0.001 is reached, indicating that professional and technical satisfaction, There is a significant positive correlation between service efficiency satisfaction and experience satisfaction; The correlation coefficients of professional and technical satisfaction, service efficiency satisfaction, experience satisfaction and problem awareness are -0.138, -0.169, -0.171 respectively, and the significance of p<0.01 is reached, indicating that professional and technical satisfaction, service efficiency satisfaction , experience satisfaction and problem awareness have a significant negative correlation. In conclusion, the correlation analysis results preliminarily confirmed the correctness of the hypothesized model.

3.6. Regression Analysis

In this study, hierarchical regression analysis was used to test the research hypotheses, and the results are shown in the following tables.

TABLE 6. HYPOTHESIS 1 REGRESSION ANALYSIS OF TECHNICAL SATISFACTION TO EXPERIENCE SATISFACTION

	Unstandardized coefficients		standardized coefficient Beta	t	salience	R^2	Adjusted R^2
	B	Standard Error					
(constant)	0.667	0.227		2.944	0.003		
Gender	0.035	0.049	0.028	0.729	0.466		
Age	0.000	0.009	0.001	0.017	0.987		
Education	0.011	0.012	0.036	0.925	0.356		
marital status	0.038	0.022	0.067	1.703	0.089	0.418	0.410
average monthly income	-0.014	0.006	-0.087	-2.231	0.026		
Technical satisfaction	0.916	0.055	0.640	16.566	0.000		

For Hypothesis 1, gender, age, education, and marital status are used as control variables, the professional and technical satisfaction of the service subject is used as an independent variable, and experience satisfaction is used as a dependent variable. It can be seen from *Table 6* that the revised R2 is 0.410, that is, the model can be the explained variance accounts for 41.0% of the total variance, and the regression equation can be established. The unstandardized coefficient of technical satisfaction to experience satisfaction is 0.916, the standardized coefficient is 0.640, and the significance level is p<0. 001.From the regression equation, it can be concluded that there is a positive correlation between technical satisfaction and experience satisfaction, and professional technical

satisfaction has a positive impact on service experience satisfaction, assuming that H1 holds. (See Table 6)

TABLE 7. HYPOTHESIS 2 REGRESSION ANALYSIS OF TECHNICAL SATISFACTION TO EFFICIENCY SATISFACTION

	Unstandardized coefficients		standardized coefficient Beta	t	salience	R^2	Adjusted R^2
	B	Standard Error					
(constant)	-0.225	0.394		-0.571	0.569		
Gender	-0.02	0.085	-0.010	-0.237	0.813		
Age	-0.015	0.016	-0.040	-0.919	0.359		
Education	-0.001	0.021	-0.002	-0.046	0.964		
marital status	9.59E-05	0.038	0.000	0.002	0.998	0.263	0.252
average monthly income	-0.003	0.011	-0.010	-0.230	0.819		
Technical satisfaction	1.137	0.096	0.514	11.815	0.000		

For Hypothesis 2, gender, age, education, and marital status are used as control variables, technical satisfaction is used as an independent variable, and service efficiency satisfaction is used as a dependent variable. It can be seen from Table 7 that the revised R2 is 0.252, that is, the explained variance in the model accounts for 25.2% of the total variance, the regression equation can be established. The unstandardized coefficient of technical satisfaction to service satisfaction is 1.137, the standardized coefficient is 0.514, and the significance level is p<0. 001.From the regression equation, it can be concluded that technical satisfaction and efficiency satisfaction are positively correlated, and professional technical satisfaction has a positive impact on service efficiency satisfaction, assuming H2 holds. (See Table 7)

TABLE 8. HYPOTHESIS 3 REGRESSION ANALYSIS OF SERVICE EFFICIENCY SATISFACTION TO SERVICE EXPERIENCE SATISFACTION

Unstandardized coefficients	standardized	t	salience	R^2	Adjusted

	B	Standard Error	coefficient Beta	t		R^2
(constant)	2.682	0.174		15.435	0.000	
Gender	0.051	0.055	0.041	0.923	0.357	
Age	0.011	0.011	0.046	1.037	0.300	
Education	0.013	0.014	0.040	0.908	0.364	
marital status	0.028	0.025	0.050	1.115	0.265	0.244 0.233
average monthly income	-0.012	0.007	-0.074	-1.663	0.097	
Service efficiency satisfaction	0.312	0.028	0.483	10.995	0.000	

	B	Standard Error	coefficient Beta	t		R^2
(constant)	0.698	0.221		3.165	0.002	
Gender	0.038	0.047	0.03	0.808	0.420	
Age	0.002	0.009	0.009	0.242	0.809	
Education	0.011	0.012	0.036	0.962	0.337	
marital status	0.038	0.021	0.067	1.751	0.081	
average monthly income	-0.014	0.006	-0.085	-2.238	0.026	0.451 0.442
Professional and Technical Satisfaction	0.761	0.063	0.532	12.146	0.000	
Service efficiency satisfaction	0.137	0.028	0.211	4.842	0.000	

For Hypothesis 3, gender, age, education, and marital status are used as control variables, service efficiency satisfaction is used as an independent variable, and experience satisfaction is used as a dependent variable. It can be seen from Table 8 that the revised R2 is 0.233, that is, the explained variance in the model accounts for 23.3% of the total variance, the regression equation can be established. The unstandardized coefficient of service efficiency satisfaction to experience satisfaction is 0.312, the standardized coefficient is 0.483, and the significance level is p<0.001.From the regression equation, it can be concluded that there is a positive correlation between service efficiency satisfaction and experience satisfaction, and service efficiency satisfaction has a positive impact on service experience satisfaction, assuming that H3 holds. (See Table 8)

TABLE 9. THE MEDIATION TEST OF SERVICE EFFICIENCY SATISFACTION

Unstandardized coefficients		standardized coefficient	t	salience	R^2	Adjusted R^2
B	Standar	ed coeffi				

This paper uses the analytical procedure suggested by Baron and Kenny to verify the mediation effect. Specifically, in Hypothesis 1, in the regression of service experience satisfaction, when the mediator variable (service efficiency satisfaction) is not added, the independent variable (professional and technical satisfaction) is the dependent variable (service experience satisfaction) have a significant impact. When the mediating variable (service efficiency satisfaction) is further added to the regression of the dependent variable (service experience satisfaction), the standard regression of the mediating variable (service efficiency satisfaction) on experience satisfaction is 0.211 and the significant P value is less than 0.05. At this time, the independent variable (professional and technical satisfaction) still has a significant positive impact on service experience satisfaction, indicating that service efficiency satisfaction has a partial mediating role in the relationship between technical satisfaction and experience satisfaction. Hypothesis H4 has been verified. (See Table 9)

After data analysis, it is found that the hypothesis test results of this study are shown in Table 10 below:

TABLE 10. HYPOTHESIS TEST RESULT STATISTICS

Serial number	Assumption	result
1	Professional and technical satisfaction has a positive impact on service experience satisfaction	established
2	Professional and technical satisfaction has a positive impact on service efficiency satisfaction	established
3	Service efficiency satisfaction has a positive impact on service experience satisfaction	established
4	Service efficiency satisfaction plays a mediating role in professional and technical satisfaction and service experience satisfaction	established

4. CONCLUSIONS

The conclusions of this paper have the following two management implications:

First, the improvement of the professional technical level of consumers' ophthalmology is crucial to the satisfaction of consumers' service efficiency and service experience. Therefore, the relevant management departments of the optometry industry in my country should clarify the development direction and strategy of the industry, vigorously develop the training of relevant high-tech professional talents, and at the same time improve the access standards of service entities and the classification and refinement of service types in the industry. Managers must It is recognized that the optimization and transformation of the market structure of the optometry industry and the impact of industry norms not only include the overall improvement of the national vision problem in our country, but also include economic and social dimensions. In the system management strategy and development strategy, it is necessary to take into account the overall consideration, incorporating economic, social and health sustainable practices into the overall management system of the industry.

Second, consumers' awareness of optometry problems, as well as their satisfaction with professional and technical services and service efficiency, have a moderating effect. For consumers with high awareness of optometry problems, the partial mediating effect of professional technical satisfaction on service efficiency satisfaction is greatly weakened. Therefore, the relevant service providers in the optometry industry should fully understand the behavioral characteristics of different consumers, conduct market segmentation and demand forecasting based on consumers' cognitive level of problems and personal characteristics such as seeking motivation, and formulate differentiated strategies.

Finally, the competent government departments at all levels in my country should take measures to encourage and promote the sustainable and optimized development of the optometry industry and the adjustment of the market structure, so as to improve consumers' awareness of optometry problems, and fundamentally ease the increasingly urgent and urgent needs of the Chinese people. At the same time, related companies in the ophthalmology and optometry industry should also refer to the relevant conclusions of this study, and increase investment in optimizing the transformation and sustainable development of traditional service entities in different dimensions and technologies.

ACKNOWLEDGMENT

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