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The Research on the Influence of Computer Music Perceived Value on Music Perception for Colleges under Different Backgrounds Based on SPSS and Regression Analysis

Lin Cui, Yan Chen and Yang Li

Art institute, Hebei Normal University of Science and Technology, Qinhuangdao, 066004, China
Email: 2067377625@qq.com

Abstract

The music is an art which reflects the reality emotion for the human. The music has a great influence on the life of the college students. According to listening to the music, the college students can obtain the perceived value. In this paper, we apply the regression analysis method to study whether the perceived value that the college students obtain by listening music can influence the music preference. According to investigating the college students in different backgrounds, we establish various hypotheses. Then we test these hypotheses by the data analysis and SPSS to achieve our purpose. Through the research results, we can guide better the college students to form the correct outlook of life and the values. This paper can also provide an effective reference for the subsequent researches. It has a certain theoretical value and practical significance.

Keywords*: the music preference; college students; data analysis; SPSS*

1. Introduction

The music is an elegant art. On the one hand, the music can enrich the emotion world for the college students. On the other hand, according to the help of the music, the college students can judgment and understand better the outside world. However, the college students have their own understandings for the music. When the college students are listening music in different backgrounds, they will obtain the different music perceptions. According to understanding these behaviors, we can guide better the college students to appreciate the music and form the correct outlook on life.

Many scholars studied the education of the college students. CaiLiman and Huang Hong studied the music learning and preference for the college students. The author thought that the music education and the related music activities in ordinary universities failed to satisfy the demand for the musical life of the college students. Furthermore, he thought that the colleges should popularize the music quality for the students [1]. According to investigating the education situation of the college students, Yao Xiaoxia pointed out the generally existing problems and phenomena for the music education of many colleges in China. Then, she put forward some opinions and suggestions for the prospective development of the music education in the ordinary university [2]. In view of the music education management and the leadership system in China, Wang Anguo reviewed and summarized comprehensively the experiences of the previous curriculum reform experiment. And they also put forward these own suggestions [3]. In addition, Hu Zhongli, Du Pengyu and Zhang Tiaotong also studied the music education of the colleges and universities [4-6].

The regression analysis was a statistical method that analyzes the data. The purpose of the method was to understand that whether the two or more variables had the correlation [7-10]. As one of the three branches in statistics, the regression analysis had a wide

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application in the data analysis. People used it to study the dependency relation among the variables. The regression analysis was a commonly used data analysis method. Through the continuous development and innovation, it played an important role in many fields [11-15]. And it derived from a lot of crossover algorithms [16-18].

In this paper, in order to guide the college students through the music education, we investigate the music perception for the college students in different backgrounds. Furthermore, we studied whether the music perception value can influence on the music preference or not. We do the hypotheses from some aspects. The aspects are Chinese and western music, arts and science, gender, the family environment, the new and old music, the learning performance and the character *etc*. Then we need to test whether these hypotheses correct. By verifying the hypotheses, we can achieve the research purpose. The structure of this paper is as follows. The first part is the introduction. In this part, we introduce briefly the related knowledge. The second part is the basic knowledge. In this part, we introduce the concept of the regress analysis and the perceived value. The third part is the data analysis. In this part, we analyze the data. Then we verify the hypotheses through the regression analysis. The last part is the conclusion.

2. The Basic Knowledge

2.1 The Model of Regression Analysis

In the regression analysis, if the relationship between the dependent variable and the independent variable is linear, we call this model is linear regression model. This model is shown as follows.

$$y = \beta_0 + \beta_1 x + \varepsilon \tag{1}$$

β_0 and β_1 are regression parameters. ε is random error term.

If we get n observed values $(y_i, x_i)(i = 1, 2, \cdots, n)$

These observed values accord with the model

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i (i = 1, 2, \cdots, n) \tag{2}$$

β_0 and β_1 are overall regression parameters. x_i is the value which we get in ith observe. y_i is the dependent variable correspondingly. ε is stochastic error term.

The regression model of the random variable y and the variable $x_1, x_2, \cdots, x_p$ is

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p + \varepsilon \tag{3}$$

$\beta_0, \beta_1, \cdots, \beta_p$ are $p+1$ unknown parameters. β_0 is regression parameters. $\beta_1, \cdots, \beta_p$ are regression coefficients. y is dependent variable. $x_1, x_2, \cdots, x_p$ are independent variables.

For the random error, we suppose

$$\begin{cases} E(\varepsilon) = 0 \\ \mathrm{var}(\varepsilon) = \delta^2 \end{cases} \tag{4}$$

We call

$$E(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p \tag{5}$$

is the theoretical regression function.

2.2 Perceived Value

The perceived value emphasizes the social value and the relationship study for the interpersonal interaction. Most scholars take the functional value, emotional value, social value and the perceived cost as the constructed dimensions of the perceived value. The

perceived value is a vocabulary in the social study. In this paper, we analyze the influence of the music perceived value on the music preference for the college students of different backgrounds. Therefore, we divide the perceived value into the functional value, the social value and the emotional value.

The functional value refers to the attribute that the products meet the utility or the functional purpose. In this paper, the functional value refers to the attribute that the music satisfies the self-value for the college students.

The social value refers to the degree that the popular image promotes. According to using a product or a brand, the public establishes the identity coupling with other social group. Because acquiring the group approval, the public can enter into one field or be familiar with one topic which has the group generality. In addition, in order to showing its inherent character or the status, the public may seek symbolically the common behavior with others. In this paper, the social value refers to that the college students establish the relationship with other peers according to the music, or they obtain the satisfaction by using the music to show their inner character and status.

The emotional value refers to that the article has the utility or the ability which can change the customer's emotion or the emotional state. The emotional value can inspire the public mood reaction, the positive emotions and the negative emotions. The positive emotions contain happy, nostalgia and loyalty *etc*. And the negative emotions contain the guilt and disgust *etc*. These emotions can influence the love degree for the public. In this paper, the emotional value refers to that the students can obtain their own values according to the music adjusting or stimulating the public.

3. Data Analysis

3.1 The Research Hypothesis

In the concept of the sociology, the group of college students only belongs to the secondary group that the connection is not tight. However, the factors of the roughly equal social status, the similar age, the common living environment and the interaction among the internal members make the group of college students have the common or similar values and behavior. In the contact of the cultural content, they will make the similar selection. Of course, this kind of choice and preference will be different due to the differences among the individual characteristics. In this paper, we will discuss that the influence of the music perception value on the music preference for the college students in different backgrounds.

(1) The different types of music often use the different way to present to the audience. Due to the different cultures between China and West, the music forms are also different. Some audiences can accept all kinds of music. And some are not. In this paper, in order to survey whether the music perception which is obtained by the Chinese music and the English music can influence the music preference, we do the following assumption for the college students.

H_1: The music perception value that the college student obtains from the Chinese music and English music can influence their music preference.

(2) In the university, because the subjects are different between the art students and the science students, their thoughts are often different. The differences of the thoughts lead to the different ways for dealing with the same things. In order to investigating whether the music perception value that the art and science students obtain can influence the music preference, we do the following assumption.

H_2: The music perception value that the art and science student obtains respectively can influence the music preference.

(3) The gender often has a great influence on the behavior or other aspects. However, in the issue of the college student music appreciation, whether there are differences among different genders of college students or not. In order to investigate whether the music perception value that the different genders of college students obtain can influence on the music preference or not, we do the following assumption.

H_3: The music perception value that college students of different genders obtain can influence the music preference.

(4) Because the difference of the family environment, the time and way that college students contact music will change. In order to investigate whether the music perception value that the college students obtain in different family environments influences the music preference or not, we do the following assumption.

H_4: The music perception value that the college students obtain in different family environment can influence the music preference.

(5) The new music production and the old music production can bring different feelings to people. In order to investigate whether the music perception value that the college students obtain from the new and old music productions influences on the music preference, we do the following assumption.

H_5: The music perception value that the college students obtain from the new and old music productions can influence the music preference.

(6) The pressure of the college students is less than the high school students. However, the college students who study hard have a considerable proportion. The learning achievement has the differences. Whether there are differences of appreciating music between the college students who get the good achievement and who get the poor achievement. In order to investigate the question, we do the following assumption.

H_6: The music perception value that the college students whose learning achievements are different obtain can influence the music preference.

(7) The personality can produce a great influence on the behavior for people. In order to investigate whether the music perception value that the college students of different personalities obtain influence the music preference, we do the following assumption.

H_7: The music perception value that the college students of different personalities obtain can influence the music preference.

3.2 The Descriptive Analysis for the Investigated Object

Firstly, we investigate and count the college students under different backgrounds. In order to better understanding that the music love degree for the college music under different background, we do the statistics according to their own situation for college students. We make the statistics on the basic situation of investigation number. The results are as follows.

Table 1.The Sample Statistics

Variable	Classification	The investigation results		
		Number	Proportion	Cumulative proportion
Gender	Male	165	53.6%	53.6%
	Female	143	46.4%	100%
Age	Less than 18	6	1.94%	1.94%
	18-23	138	44.8%	46.74%
	24-27	121	39.3%	86.04%
	27-31	35	11.4%	97.44%
	More than 31	8	2.56%	100%
Education	Junior student	13	4.22%	4.22%

background	Undergraduate	117	38.0%	42.22%
	Master	152	49.4%	91.62
	Doctor	26	8.38%	100%
The history of listening music	Less than one year	2	0.65%	0.65%
	1-5 years	53	17.2%	17.85%
	5-7 years	103	33.4%	51.25%
	7-10years	108	35.1%	86.35%
	More than 10 years	42	13.65%	100%
How much time spend on music	Less than 1hour	3	1.03%	1.03%
	1-20 hours	93	30.1%	31.13%
	20-40 hours	113	36.7%	67.83%
	40-60 hours	92	29.9%	97.73%
	More than 60 hours	7	2.27%	100%

3.3 The Reliability Analysis of the Sample Data

The reliability analysis is a comprehensive measuring system. It is an effective analytical method than can effectively judgment whether it has a certain stability and reliability. The Krone Baha coefficient (Cronbach's) is a statistics which is proposed by L. J. Cronbach. It refers to the average value of split half reliability coefficient that all possible projects division methods obtain. Cronbach's coefficients are applied to the multiple choice questions. And it is no requirement for the variance. The formula is as follows.

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{\gamma_i}^2}{\sigma_X^2}\right) \tag{6}$$

Among them, K is the sample data. σ_X^2 Is the variance of the total sample. And $\sigma_{\gamma_i}^2$ is the variance of the currently observed sample.

This research applies Cronbach's coefficient to test the scale reliability. If α coefficient is less than 0.6, we think that the consistent internal reliability is not enough. If α coefficient is between 0.7 and 0.8, it says that it has a considerable reliability. It α coefficient is between 0.8 and 0.9. This means that the scale reliability is very good. According to SPSS18.0 statistical software tests the reliability, this survey questionnaire data are as follows.

Table 2. The Survey Reliability Test

Code	Cronbach's Alpha
H_1	0.834
H_2	0.821
H_3	0.726
H_4	0.833
H_5	0.797
H_6	0.847
H_7	0.815
The total scale	0.871

From the table, we can see that the α coefficient of the total scale in this questionnaire is 0.871. And it is more than 0.8. Therefore, the reliability is very good. In addition, the

α coefficient which corresponds to the sub-scale is more than 0.7. It meets the statistics requirement. Therefore, in this study, the questionnaire has high internal reliability.

3.4 The Validity Analysis

For the questionnaire, validity is the most important condition. Some scholars divide the validity into three types. The first is the content validity. The content validity refers to measure whether the content of the questionnaire reflects the degree of meeting the research content. The purpose is to check the rationality of measuring the content systematically. We identify whether the measuring content reflects the basic content according to the research concept. The second is the criterion related validity. It refers to the degree of the consistency between the measurement results and the validity standard. The third is the construct validity. It points that the questionnaire can measure the degree of the expected characteristics in theory. The questionnaire measuring construction shows that the scientific meaning consistent the theoretical assumption. According to comparing with the theory hypothesis to judgment, it is called the validity theory.

In the above three kinds of commonly validity analysis method, for the criterion related validity method, it is difficult to select a suitable criterion. Therefore, in this study, we do not apply this method. The scale that the questionnaire adopts references the existing model. Based on the existing research results, we put forward the hypothesis which suits this paper. Therefore, in this paper, the designed scale has a very strong research. At the same time, the focus of the paper is to test the structural validity of the scale.

Table 3. The Measurement Effect of the Perceived Value KMO Sample and the Test Results of Bartlet Sphere

KMO sample measure		0.823
Bartlett sphere test	Chi square estimation value	1613.27
	Freedom	43
	Significant	0.000

From the above table, we can see that the perceived value sample is 0.823. It is bigger than 0.7. Therefore, it is suitable for the factor analysis. However, the significant probability of the Bartlett sphere test is 0.000 and it is less than 0.01. It explains that the data correlation coefficient is not the unit matrix. Each index is not independent. The value has the relation. Therefore, it can do the factor analysis.

3.5 Regression Analysis

Before the multiple linear regression analysis, we need to test that whether the data meet the hypothesis of the linear regression analysis firstly. This regression model is reasonable and effective. The hypothesis of the regression analysis and the test methods has respectively the independence among the no-multi-collinearity, the homogeneity of variance and the error terms. In this paper, we measure the three indexes mainly. The analysis results are as follows.

Table 4. The Fitting Test

Correlation coefficient	Determination coefficient	Adjusted Determination coefficient	The estimated standard error of the regression equation	DW test
0.867	0.764	0.778	0.533	1.974

From the above table, the adjusted determination coefficient is 0.778. The fitting is better. The DW testing value of the equation closes to 2. It indicates that the auto-correlation among the errors is small.

Table 5. F Testing

The GDP of variance	The freedom df	F	Sig
241.63	15	57.421	0.000

From the above table, the corresponding probability P value of F testing is 0. Therefore, according to the F testing, the regression equation can establish the linear model.

The predictors are age, education background, the history of listening music, how much time spend on music, functional value, social value and emotional value. The dependent variable is the music preference.

Table 6. The Regression Analysis of Music Preference

Model	B	β	t	$sig.$	Tolerance	VIF
Predictors	2.738			0.00		
Age	0.030	0.041	0.134	0.013	0.823	1.297
Education background	0.056	0.058	0.168	0.047	0.784	1.331
The history of listening music	0.103	0.124	0.768	0.273	0.724	1.265
How much time spend on music,	0.142	0.138	0.812	0.362	0.893	2.387
Functional value	0.213	0.243	0.671	0.039	0.825	2.151
Social value	0.187	0.238	1.862	0.031	0.759	1.764
Emotional value	0.083	0.092	1.387	0.020	0.838	2.263

From the above tables, the adjusted determination coefficient is 0.778. The fitting is better. The DW testing value of the equation closes to 2. It indicates that the auto-correlation among the errors is small. The probability of T-test for perceived value is less than 0.05. It means there is a remarkable correlation. Tolerances are bigger than 0.7 and the VIF are less than 3. These mean that the multi-collinearity is weak.

3.6 T Testing

In order to verify the differences of the two correlations, we divide it by its standard error. And we compare the results with the corresponding sample distribution critical value.

The difference of the correlation coefficient is not only subject to normal distribution, but also not subject to $t-distribution$. Therefore, we must use the following equation of Fisher z-transformation to transfer the two correlation coefficients r_1 and r_2 to z value. That are z_1 and z_2. Among them, r is the correlation coefficient. In is the natural logarithm.

$$z = \frac{1}{2} In \frac{1+r}{1-r} \tag{7}$$

Then, we obtain the difference between z_1 and z_2. Then it divides the combined standard error of z_1 and z_2 (seeing the denominator in equation 4.2 and n is the sample size). The result is also a z-value. It obeys normal distribution. Therefore, we determine whether it is significant according to the critical point of the normal distribution.

$$\Delta z = \frac{z_1 - z_2}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}} \tag{8}$$

We obtain the hypothetical T test of correlation coefficient. The tables are as follows.

Table 7. The Correlation Coefficient and its T Testing Table

hypothesis	variable	B		$\lvert \Delta Z \rvert$
		Chinese music	Foreign music	
H_1	Functional value	0.207	0.211	2.134
	Social value	0.163	0.202	2.078
	Emotional value	0.177	0.208	2.093
H_2	variable	Arts	Science	$\lvert \Delta Z \rvert$
	Functional value	0.207	0.233	2.378
	Social value	0.120	0.177	1.462
	Emotional value	0.106	0.081	0.811
H_3	variable	Male	Female	$\lvert \Delta Z \rvert$
	Functional value	0.142	0.201	1.731
	Social value	0.155	0.200	2.058
	Emotional value	0.169	0.193	1.988
H_4	variable	Rural	City	$\lvert \Delta Z \rvert$
	Functional value	0.211	0.256	2.431
	Social value	0.150	0.197	2.052
	Emotional value	0.190	0.201	2.113
H_5	variable	New music	Old music	$\lvert \Delta Z \rvert$
	Functional value	0.219	0.228	2.201
	Social value	0.213	0.220	2.137
	Emotional value	0.222	0.268	2.574
H_6	variable	The front 30%	The behind 60%	$\lvert \Delta Z \rvert$
	Functional value	0.167	0.190	1.989
	Social value	0.082	0.097	0.634
	Emotional value	0.155	0.203	2.077
H_7	variable	Introversion	Extroversion	$\lvert \Delta Z \rvert$
	Functional value	0.102	0.166	1.398
	Social value	0.196	0.243	2.377
	Emotional value	0.099	0.127	0.909

In General, in the significant level of 95%, the critical point which is less than Z-distribution is 1.96. It illustrates that the grouping regression is not significant. From the

above table, we can see that ΔZ of the functional value, social value and emotional value is more than 1.96. Therefore, the H_1 hypothesis supports.

In H_2. ΔZ of the social value and emotional value are less than 1.96. Therefore, H_2 does not support.

In H_3, ΔZ are less than 1.96. Therefore, H_3 supports.

In H_4, ΔZ are more than 1.96. Therefore, H_4 support.

In H_5, ΔZ are more than 1.96. Therefore, H_5 support.

In H_6. ΔZ of the social value is less than 1.96. Therefore, H_6 does not support.

In H_7. ΔZ of the functional value and emotional value are less than 1.96. Therefore, H_7 does not support.

Table 8. The Verification Results of the Hypothesis

H	Verification results
H_1	Support
H_2	Not Supports
H_3	Supports
H_4	supports
H_5	Supports
H_6	Not Supports
H_7	Not supports

After a series of analysis, we can get the analysis results. The verification results of hypothesis are in above table. From this table, we know that H_1, H_3, H_4 and H_5 support. H_2, H_6 and H_7 do not support.

4. Conclusion

The meanings that the music transfers have a certain effect for the college students to judgment and understand the outside world. The music is not a simple set of the sounds. The music contains rich contents and feelings. And even the music contains the life value. We appreciate the music while we understand the music inevitably. For the college students who are in the process of the socialization, the music will have a more important role.

In this paper, we study whether the music perceived value that the college students obtain under different backgrounds can influence the music preference or not. We do a bit of work. Firstly, we introduce the significance of the perceived value and the meaning in this paper. Secondly, we construct the hypotheses. We construct the related hypotheses according to establish the basic framework in this paper. Thirdly, we verify these hypotheses for this paper through the SPSS and data analysis. In the verification process, we can better understand the behavior and habit of the contemporary university student. Furthermore, we guide the college students to appreciate the music and form a correct outlook on life.

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Authors

Lin Cui, She received her Master in music teaching in Capital Normal University（2005）. Bachelor of Arts in Education B.A.Ed., B.A.E. Now she is the full professor of vocality in Hebei Normal University of Science & Technology. Associate professor, Minzu University of China. Her current research includes musicology and music teaching.

Yan Chen, She graduated from the Conservatory of Music, Hebei Normal University majoring in musicology and got the master's degree in 2003. Working in the Arts Department, Hebei Normal University of Science and Technology as a teacher and researching on musicology, music theory teaching and creation technique for computer music.

Yang Li, She received her Master in music teaching in Hebei Normal University. Now she is the full professor of vocality in Hebei Normal University of Science & Technology. Her current research includes musicology and music teaching.

