Study on the factors influencing the study of adolescents in rebellious period

Fan Li[1, a], TingTing Zheng[2, b]

[1]School of Statistics, Shanxi University of Finance and Economics, Taiyuan030006, Shanxi, China

[2]Faculty of Business Administration, Shanxi University of Finance and Economics, Taiyuan030006, China

[a]2865028431@qq.com, [b]731903895@qq.com

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Abstract: The academic performance of children in school is very important to them and has received much attention from parents, schools and the society.However, teenagers in the stage of rebellion, the characteristics are still very distinct, such as dress unconventional, like to follow the trend, chasing stars.The consequences of all these behaviors will be reflected in the academic performance of teenagers. Therefore, this paper focuses on the study of the changes in the academic performance of teenagers in the rebellious period by applying statistical methods from the CFPS Chinese family tracking survey _2016 children's questionnaire database.

1. Assessment of adolescent academic performance

The scale of adolescent academic performance in this questionnaire is a five-level scale. Firstly, 19 variables were used to conduct principal component analysis of adolescent academic performance. SPSS outputs the results of this study as follows:

Tab. 1 KMO and bartlett test

KMO sampling fitness quantity		.856
Bartlett's sphericity test	the approximate chi-square	10670.564
	Degrees of freedom	171
	significant	.000

That is, the KMO test coefficient in this study is 0.856. According to the corresponding table of coefficient relation, we believe that the data structure of this study is very good, with correlation, which meets the test hypothesis of linear correlation.Bartlett's test of the null hypothesis is the study of the correlation matrix between data is a perfect matrix, and all the Numbers on the diagonal is 1, the Numbers on a diagonal is 0, at this time there is no correlation between the variables, namely multiple variables cannot be reduced to a few variables, so our family composition analysis is the premise of we want to reject the null hypothesis.It can be seen from the figure above that the P value of Bartlett's test is less than.001, so it is considered that this data can be used for principal component analysis.

The separate analysis and test results of KMO on each variable are summarized as follows:

Tab. 2 KMO test table

Variable	KMO measure
pressure	.718
I study very hard	.896
check school work	.909
put things in order	.912
play after school work is done	.916
satisfied with the head teacher	.809
satisfied with Chinese teacher	.839
satisfied with the math teacher	.887

follow school rules	.910
satisfied with the foreign language teacher	.917
watching TV	.655
will concentrate on study	.897
Suitable for student cadres	.873
good	.889
Internet usage	.564
read newspapers and periodicals	.689
others tell	.728
mobile phone short message	.644
radio	.198

As can be seen from the figure above, the KMO values of the mobile network module scale are all less than 0.7, so the variables of academic performance in principal component analysis are not correlated with the variables of mobile network module, so the independent variables are removed and principal component analysis is performed again.The variance of the common factor output by SPSS is as follows:

Tab. 3 Common factor variance

Common factor variance		
	initial	extract
pressure	1.000	.075
I study very hard	1.000	.519
Check school work	1.000	.509
Put things in order	1.000	.459
Play after school work is done	1.000	.521
The teacher in charge	1.000	.746
Chinese teacher	1.000	.675
The math teacher	1.000	.608
Follow school rules	1.000	.480
Foreign language teacher	1.000	.536
Will concentrate on study	1.000	.582
Suitable for student cadres	1.000	.458
How good	1.000	.483
Others tell	1.000	.519
extraction method: principal component analysis		

As can be seen from the figure above, the initial value of each variable is 1 in the column, which means that the variation degree of each variable is 100% explained, and the explanation degree of the extracted column is reduced due to the retention of some components.

The interpretation degree of common factor variance is shown in the following figure:

Tab. 4 Factor screening table

composition	Initial eigenvalue			Sum of the extracted loads		
	total	Percentage of variance	cumulative %	total	Percentage of variance	cumulative %
1	4.502	32.154	32.154	4.502	32.154	32.154
2	1.594	11.386	43.541	1.594	11.386	43.541
3	1.074	7.675	51.216	1.074	7.675	51.216
4	.993	7.095	58.310			
5	.921	6.578	64.888			
6	.732	5.228	70.116			

According to the above table, the eigenvalue of the third principal component is 1.074, greater than 1, while the fourth principal component is 0.993, less than 1. The first three principal components should be retained, and the rest should be removed.In order to prevent doubts caused by the fourth principal component's eigenvalue approaching 1 and the variance interpretation degree being greater than 70%, we used SPSS to assist in the forced extraction of principal components.After re-running the principal component analysis, the output results are as follows

Tab. 5 The rotated composition matrix

the rotated composition matrix a				
	composition			
	1	2	3	4
will concentrate on study	**.732**	.191	.101	-.032
play after school work is done	**.701**	.160	.073	-.056
Check school work	**.697**	.098	.114	.047
I study very hard	**.687**	.120	.189	-.013
Put things in order	**.658**	.162	.003	.074
Follow school rules	**.643**	.261	-.008	.079
The teacher in charge	.176	**.844**	.050	.002
Chinese teacher	.170	**.801**	.067	.014
The math teacher	.191	**.751**	.085	-.001
Foreign language teacher	.195	**.703**	.068	.005
Others tell	-.152	.038	**.720**	.016
Suitable for student cadres	.330	.044	**.607**	-.001
How good	.374	.191	**.562**	.030
pressure	.049	.009	.033	**.993**

Extraction method: principal component analysis.

On the coefficient of correlation coefficient is greater than 0.3 bold, such as above, this study finally extracted four principal component, by the correlation between the variables in each group were greater than 0.3, the thought that there was a linear correlation between the study variables by KMO test coefficient is 0.856, a single variable coefficient of KMO test were greater than 0.7, think data structure is reasonable, Bartlett's test results for $P < 0.001$, suggesting research data can be the principal component analysis.The results of principal component extraction showed that the characteristic values of the first three principal components were greater than 1, which explained the total data variation of 32.2%, 43.5% and 51.5% respectively.

Therefore, the first four principal components were extracted and 58.31% of the data variation was explained by category, respectively reflecting the academic enthusiasm, management ability, carefulness and discipline compliance of adolescents.Let the children's academic performance be y, the teenagers' academic enthusiasm be x1, the teenagers' management ability be x2, the teenagers' carefulness degree be x3, and the teenagers' discipline degree be x4. According to the cumulative interpretation degree of principal components, the following formula can be obtained:

$$y = 0.55x_1 + 0.19x_2 + 0.13x_3 + 0.12x_4$$

2. Conclusion

When other factors remain unchanged, the academic enthusiasm of adolescents accounts for 55% of the overall academic performance. The higher the academic enthusiasm of adolescents in the rebellious period, that is, the better the students' academic level is, i.e. their listening to lectures in class and their completion of homework.The teenagers' management ability accounted for 19% of their overall academic performance, and the students with strong self-management ability also had better academic performance, accounting for about one-fifth of their overall academic

performance.Teenagers' carefulness has an impact on their overall academic performance of 13%, and teenagers' discipline compliance has an impact on their overall academic performance of 12%, which indicates that examination carefulness and discipline compliance at school have an impact on their overall academic performance of about 1/4.The more disciplined the students were at school and the more careful they were at exams, the higher their academic performance.

References

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