# Based on the principal component method of weibo on cultivating college students' sports value analysis

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**Abstract.** Weibo is contemporary college students leave the way of access to information, timeliness, and place of weibo make it became an important tool to affect college students' sports values. Taking college students as the research object, in view of college students contact weibo the motives of sports information, and the motivation of college students' physical exercise investigation, using principal component analysis (pca) to analyze the results of the survey. Weibo, according to the results of analysis for the contact of the motives of sports information analysis, the motivation of college students is to increase knowledge in sports stories, kill time, and understand the sports stars. For the analysis of the physical exercise motivation, the motivation of college students is to own hobby, and improve the level of movement and grades, mastering a skill.

## 1 Introduction

Weibo, WeChat, micro public welfare has become a fashion vocabulary. College students as the strongest people accept ability, became the representative of fashion. However, weibo influence on college students' sports values is worth the attention of people. Sun Zhubing in 2008, in the theory of the impact on the socialization of college students' sports values, points out that the sports value is a kind of special values, it can be divided into health, education, competition, entertainment and economic five values. These five values for college students is the healthy growth of body and mind has an important guiding role. In this paper, the integrated use of knowledge of many subjects, and studied the sports values, research has shown that for the majority of college students, sports values is positive, the five values of sports, sports health values of the mainstream. At the same time, the author pointed out that the values of sports competition is the basic quality of college students to adapt to the contemporary social fierce competition.

This paper will take college students as the research object, the motivation of weibo for contact sports information and participate in sports activities motivation from two aspects, to study the microblog influence on college students' sports value.

## 2 Model Establishment

Data in Tables 1-2 is from the article “Research on microblog impacts on Xian university students sports values and sports participation behaviors”.

Sports values divide into social values and individual values. University students’ physical exercises participation motivation and university students’ microblog sports information participation motivation affect university students’ sports values. Due to motivations items are quite a lot, we adopt principal component analysis method to extract principal components in motivation items. Main thought of principal component analysis is variable’s dimension reduction. It is a statistical analysis method that transforms multiple variables into fewer main variables. It generally is used to data compression, system evaluation, regression analysis and weighted analysis so on.

### 2.1 Principal component analysis method

Main way of principal component analysis is reducing dimension of variables, which is recombining original many variables with correlation into a group of uncorrelated variables to replace original variables. Therefore, we can pay attention to every time observation’s variables that have maximum variation, for every time observation’s small changed variables that can be used as constant to process and get rid of them, so that it reduces variables number in problem that needs to be considered.

### 2.2 University students’ microblog sports information contacting motivations analysis result

When analyze university students microblog sports information contacting motivations, increase new

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**Table 1.** Each part of university student microblog sports information contacting motivation.

| Motivation | Women | Men | Sports | Literature and History department | Science and engineering department | Junior grade | Senior grade |
|---|---|---|---|---|---|---|---|
| Increase new knowledge of sports | 46.3 | 37.6 | 38.1 | 43.8 | 43.8 | 46.8 | 38.5 |
| Learn each kind of sports competitions | 31.9 | 54.9 | 47.6 | 37.1 | 46.3 | 38.2 | 45.3 |
| Pursuit of entertainment | 49.5 | 28.4 | 33.3 | 48.5 | 31.4 | 43.5 | 37.5 |
| Enthusiasm for sports | 11.6 | 28.4 | 31.7 | 9.8 | 26.4 | 12.4 | 25 |
| Solve problems that one come across in sports activities | 11.1 | 18.5 | 14.3 | 12.4 | 17.4 | 14 | 14.6 |
| Pass time | 31.5 | 16.1 | 23.8 | 27.8 | 20.7 | 30.6 | 19.3 |
| Learn sports stars comments | 24.5 | 20.4 | 20.6 | 25.3 | 19.8 | 20.4 | 25 |
| Learn sports host, commentator, narrator | 32.4 | 29.6 | 34.9 | 32.5 | 27.3 | 31.7 | 30.7 |
| Personal habits | 16.2 | 16.1 | 12.7 | 14.9 | 19.8 | 18.3 | 14.1 |
| Participate in communication of each kind of sports information opinions | 17.6 | 20.4 | 25.4 | 14.4 | 22.3 | 17.2 | 20.3 |

**Table 2.** Each part of university student physical exercises participation motivation.

| Motivation | Women | Men | Sports | Literature and History department | Science and engineering department | Junior grade | Senior grade |
|---|---|---|---|---|---|---|---|
| Personal hobbies | 46.7 | 58 | 68.3 | 43.8 | 55.4 | 51.1 | 52.1 |
| Body building | 70.3 | 72.8 | 71.4 | 75.3 | 65.3 | 74.7 | 68.2 |
| A communicative way with classmates and friends | 32.9 | 38.9 | 36.6 | 31.9 | 40.5 | 34.4 | 36.5 |
| Passive participation | 15.7 | 12.3 | 14.3 | 14.4 | 14.1 | 19.4 | 9.3 |
| Improve sports level and performance | 30.1 | 32.7 | 42.9 | 31.4 | 24.8 | 28 | 34.4 |
| Lose weight and shape body | 42.6 | 26.5 | 36.6 | 39.2 | 29.8 | 33.3 | 38 |
| Temper mind, promote attainment | 35.2 | 28.4 | 36.6 | 32.5 | 29.8 | 33.9 | 30.7 |
| Master a kind of technology | 23.1 | 32.7 | 46 | 26.3 | 19 | 25.8 | 28.6 |

knowledge of sports, learn each kind of sports competitions, pursuit of entertainment, enthusiasm for sports, solve problems that one come across in sports activities, pass time, learn sports stars comments, learn sports host, commentator, narrator, personal habits, participate in communication of each kind of sports information opinions,their corresponding variables 1—10(VAR00001—VAR00010).

From Table 3, it is clear that increase new knowledge of sports, learn each kind of sports competitions, pursuit of entertainment, enthusiasm for sports, solve problems that one come across in sports activities, pass time, learn sports stars comments, learn sports host, commentator, narrator, personal habits, participate in communication of each kind of sports information opinions these ten factors variable communalities are higher that between 0.8—1.0, which shows most of variables can be extracted, principal component analysis is valid.

**Table 3.** Variables communalities table.

| | Initial | Extract |
|---|---|---|
| VAR00001 | 1.000 | .994 |
| VAR00002 | 1.000 | .960 |
| VAR00003 | 1.000 | 1.000 |
| VAR00004 | 1.000 | .968 |
| VAR00005 | 1.000 | .974 |
| VAR00006 | 1.000 | .999 |
| VAR00007 | 1.000 | .944 |
| VAR00008 | 1.000 | .953 |
| VAR00009 | 1.000 | .995 |
| VAR00010 | 1.000 | .881 |

Extract method: principal component analysis.

**Table 4.** Factor contribution ratio table.

| Component | Initial feature value | | | Extract squares sum and load in | | | Rotate squares sum and load in | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Variance % | Accumulation % | Total | Variance % | Accumulation % | Total | Variance % | Accumulation % |
| 1 | 6.265 | 62.647 | 62.647 | 6.265 | 62.647 | 62.647 | 4.914 | 49.138 | 49.138 |
| 2 | 2.382 | 23.818 | 86.465 | 2.382 | 23.818 | 86.465 | 2.393 | 23.934 | 73.072 |
| 3 | 1.023 | 10.227 | 96.692 | 1.023 | 10.227 | 96.692 | 2.362 | 23.620 | 96.692 |
| 4 | .329 | 3.295 | 99.987 | | | | | | |
| 5 | .001 | .013 | 100.00 | | | | | | |
| 6 | 4.544E-6 | 4.544E-5 | 100.00 | | | | | | |
| 7 | 1.386E-16 | 1.386E-15 | 100.00 | | | | | | |
| 8 | 3.395E-17 | 3.395E-16 | 100.00 | | | | | | |
| 9 | -7.977E-17 | -7.977E-16 | 100.00 | | | | | | |
| 10 | -2.974E-16 | -2.974E-15 | 100.00 | | | | | | |

Extract method: principal component analysis.

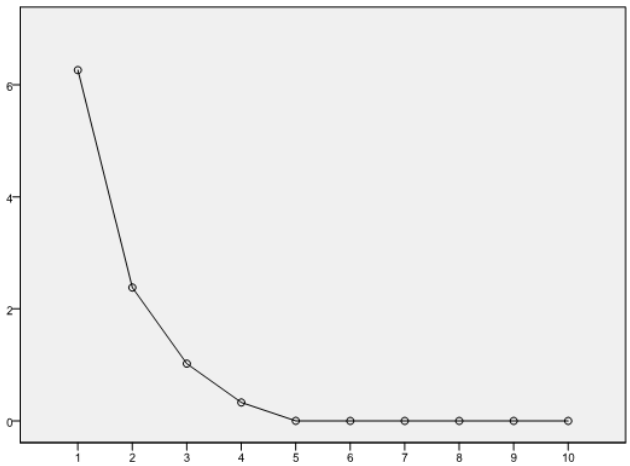


**Figure 1.** Scree plot.

Figure 1 is feature values' scree plot. From Figure 1, it is clear that the factors 1, 2, 3 are in the relative steeply slope, and starts from the fourth factor, the slope turns to be gentle. Generally main factors are in the relative steeply slope position. Therefore we select three factors as main factors.

### 2.3 University student physical exercises participation motivation analysis result

The analysis process is similar to university students' microblog sports information contacting motivation analysis process. Personal hobbies, body building, a communicative way with classmates and friends, passive participation, improve sports level and performance, lose weight and shape body, temper mind promote attainment, master a kind of technology, they correspond to components 1-8 (VAR00001-VAR00008). It is clear that components 1-4 occupy 100% of total feature values that are personal hobbies, body building, a communicative way with classmates and friends, passive participation the four factors.

## 3 Conclusion

The method utilizes dimension reduction thought to use fewer variables to replace original multiple variables, these fewer variables can reflect original data most information. In addition, the model more focuses on information comprehensive evaluation. The method also has certain drawbacks, the model's principal component is composed of original factors linear combinations, so principal components actual significances are hard to define, just functions as dimension reduction. In the paper, it provides calculation component $z_i$ so as to easy to such kind of problems research in later period, and reduce research factors numbers. It gets conclusion that for analysis of microlog sports information contacting motivation, university students' main motivations are increase new knowledge of sports, pass time, and learn sports stars comments. For physical exercises participation motivation analysis, university students' main motivations are personal hobbies, improve sports level and performance, and master a kind of technology. Therefore, on a whole, university students' sports values are good and still to be further improved.

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