Research on Parameter System Identification Characteristics of Physical Exercise Population in Gansu Province Based on Walking and Taijiquan

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Abstract. Walking, Taijiquan and other urban sports in Gansu Province is an important factor to improve the quality of competitive sports. In this paper, the characteristics of parameter system identification of urban sports population in Gansu Province are established, and the development characteristics of all social strata of urban sports population in Gansu Province are investigated by mathematical statistics and MATLAB simulation. It provides a reference for the study of urban physical exercise population in Gansu Province. The simulation results verify the feasibility and effectiveness of the parameter system identification method of the urban physical exercise population in Gansu Province, which has important application and reference value in the theoretical research of scientific research. In order to promote the harmonious development of all social strata, we should establish the correct orientation of gender value and strengthen the construction of sports ecological environment.

Keywords: Parameter system, identification characteristics, mathematical analysis, MATLAB simulation, experimental research and analysis.

1. Introduction
Sports population is a population phenomenon and sports phenomenon when economy and society develop to a certain historical stage. Sports population is an important index of social sports, which reflects people's participation and affinity in sports. It is also a sign of economic and social development [1-3]. At present, the criteria for determining the sports population in China are as follows: more than 3 times of physical activity frequency per week; more than 30 minutes of physical activity time per time; more than J. A sports population can be calculated if the above three conditions are met at the same time [3-13]. The modernization of physical education in Colleges and universities is a complex and gradual process from the traditional to the modern [14-23]. There are many dimensions to measure the modernization of physical education in Colleges and universities. One of the important contents is the proportion of College Students' physical education population [24-26],
which can be said to be an important sign of the development level of physical education in a college or the whole college. For this reason, many experts and scholars have made beneficial exploration on the current situation and development trend of College Students’ sports population.

In this paper, the characteristics of parameter system identification [27-40] of urban sports population in Gansu Province are established, and the development characteristics of all social strata of urban sports population in Gansu Province are investigated by mathematical statistics and MATLAB simulation. The simulation results verify the feasibility and effectiveness of the parameter system identification method of the urban physical exercise population in Gansu Province, which has important application and reference value in the theoretical research of scientific research. In order to promote the harmonious development of all social strata, we should establish the correct orientation of gender value and strengthen the construction of sports ecological environment.

2. Research object and method

2.1. Research object

According to the per capita disposable income (subject to 2018) of 16 cities in Gansu Province, taking 29957 yuan of per capita disposable income of urban residents in 2018 as a reference, and then randomly select three communities in each city according to the high, medium and low income level to conduct household survey, and issue 3200 questionnaires, of which 3030 are valid questionnaires, with a recovery effective rate of 94.7%, and unified application The questionnaire was statistically processed with knowledge of accounting.

2.2. Experimental method

There are 916 cases that meet the criteria of sports population, including 490 males and 426 females.

3. Analysis of places and forms of exercise for urban sports population of all levels

It can be seen from table 1 that: the first, second and third categories of people mainly choose to exercise in public sports venues, fitness clubs and other places with relatively good environment, followed by unit or residential community sports venues.

Table 1 Selection of physical exercise for all classes of urban sports population in Gansu Province (n = 916).

| Occupation category | Sports population | Beside the highway n % | Park n % | Body building Club n % | natural region % | Another place N% |
|---------------------|-------------------|------------------------|---------|------------------------|------------------|-----------------|
| First category      | 106               | 7.60                   | 11.10 38 | 26.24.53               | 7.60             | 2.187           |
| Second categories   | 132               | 11.83                  | 15.11 36 | 31.23.48               | 7.50             | 0.00            |
| Third categories    | 142               | 15.10.56               | 17.12 68 | 32.22.54               | 3.21             | 1.07            |
| Fourth categories   | 109               | 13.11.93               | 17.15 60 | 9.86                   | 4.36             | 0.00            |
| Fifth categories    | 102               | 20.19.61               | 17.16 67 | 2.19                   | 2.19             | 1.098           |
| Sixth categories    | 98                | 18.18.38               | 15.15 31 | 2.20                   | 5.50             | 2.04            |
| Seventh category    | 64                | 5.78                   | 13.20 31 | 2.31                   | 6.938            | 3.469           |
| Eighth category     | 163               | 29.17.79               | 42.25 77 | 2.12                   | 2.12             | 0.00            |
| Total               | 916               | 118.12.88              | 157.17.14 | 125.13.65             | 30.328           | 9.098           |
Fig. 1 Selection of physical exercise for all classes of urban sports population in Gansu Province (n = 916).

According to the ranking of 916 sports population in five categories, the reasons are as follows: the stadium in the unit or residential area is close to home, it is convenient to exercise, and it can basically meet the needs of individual fitness projects.

4. Experimental analysis and research
In this paper, the model system parameter identification of the current situation of sports population in the old area of Gansu is established.
4.1. Analysis on the educational level of urban sports population in Gansu Province

Table 2 Education level of urban social sports population in Gansu Province (n = 3200, n = 916).

| Degree of Education | University and above | High school (technical secondary school) | Junior middle school | Primary school | Illiterate, semi illiterate | Total |
|---------------------|----------------------|------------------------------------------|----------------------|----------------|-----------------------------|-------|
| Proportion of samples (%) | 328 (10.25) | 786 (24.56) | 996 (31.13) | 703 (21.97) | 387 (12.09) | 3200 (100) |
| Proportion of sports population (%) | 190 (58.01) | 420 (53.46) | 201 (20.28) | 131 (18.67) | 42 (10.86) | 916 (28.63) |
| Sex ratio (%) (%) | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 105 (32.15) | 105 (32.15) | 238 | 238 | 105 | 105 | 138 | 138 | 138 | 138 | 138 | 138 | 138 | 138 |
| 32.15 | 32.15 | 30.27 | 30.27 | 30.27 | 30.27 | 13.85 | 13.85 | 13.85 | 13.85 | 13.85 | 13.85 | 13.85 | 13.85 |
| 93 | 93 | 184 | 184 | 93 | 93 | 9.65 | 9.65 | 9.65 | 9.65 | 9.65 | 9.65 | 9.65 | 9.65 |
| 28.32 | 28.32 | 23.47 | 23.47 | 28.32 | 28.32 | 9.47 | 9.47 | 9.47 | 9.47 | 9.47 | 9.47 | 9.47 | 9.47 |
| Proportion in total population of social sports (%) | 20.74 | 45.85 | 21.94 | 14.30 | 4.59 | 100 |

The cultural structure of China's sports population shows an obvious trend of "rising with the tide", that is, the higher the education level, the larger the proportion of sports population, which fully shows that people's participation in sports to a certain extent depends on a person's cultural and educational level. The findings in Table 2 also confirm this assertion.

In the laboratory of model system parameter identification, this paper establishes the model system parameter identification of the current situation of sports population in Gansu Ningxia old area, studies in-depth the identification of running sports population, Uses MATLAB software to simulate and analyze the identification mode.

Gymnastics Sports Population and other sports population, and uses MATLAB software to simulate and analyze the identification mode, as shown in Fig. 2 and 4.

Fig. 2 Education level of urban social population identification in Gansu Province (n = 3200 n = 916).

It can be seen from table 3 that the cultural structure of all social strata in the urban sports population is mainly high school and junior high school. The education level of the heads of state organs, party and mass organizations, enterprises and institutions is the highest, followed by the professional and technical personnel, clerks and relevant personnel, and the proportion of the sports population in these three strata is also high.
4.2. Analysis of the characteristics of cultural structure of the urban sports population in Gansu Province

Table. 3 cultural structure of social sports population at all levels in Gansu Province (n = 916)

| Degree of Education | University people | Middle school people | Primary school people | Total social people |
|---------------------|-------------------|----------------------|-----------------------|---------------------|
| Management          | 56 24.35          | 6 249                | 0 0.00                | 98 10.70            |
| Professional        | 109 47.39         | 27 11.02             | 4 1.91                | 191 20.85           |
| Clerks              | 36 15.65          | 77 31.95             | 37 17.58              | 235 25.66           |
| Worker              | 22 9.36           | 67 27.80             | 72 34.45              | 206 22.49           |
| employer            | 2 0.74            | 9 2.90               | 19 9.39               | 36 3.93             |
| private businessman | 5 2.17            | 39 16.18             | 48 22.97              | 101 11.03           |
| Other               | 0 0.00            | 16 6.64              | 29 13.88              | 49 5.35             |
| Total               | 230 100           | 241 100              | 209 100               | 916 100             |

Fig. 3 Model system parameter identification laboratory.

Fig. 4 Other classes Sports population identification.
In Figure 2 and 4, simulation results verify the feasibility and effectiveness of the parameter system identification method of the urban physical exercise population in Gansu Province, which has important application and reference value in the theoretical research of scientific research. In order to promote the harmonious development of all social strata, we should establish the correct orientation of gender value and strengthen the construction of sports ecological environment.

5. Summary
(1) In this paper, the realization of social class harmony is the internal need of building a harmonious society, which reflects the stability level of a society. The development of urban sports population in Gansu Province is unbalanced, and the proportion of sports population is different in stratum structure, cultural level, economic situation and gender. The government must take effective measures to establish a fair and reasonable income distribution system, pay attention to the vulnerable groups and narrow the income gap; promote the equity and justice of education of all levels, guarantee the equal employment rights of all levels, promote the reasonable development of social stratum structure, strengthen the construction of sports environment, so as to make the people of all levels get along harmoniously in the happy fitness activities, And then promote the development of society in the direction of health, civilization and harmony.

(2) In this paper, the characteristics of parameter system identification of urban sports population in Gansu Province are established, and the development characteristics of all social strata of urban sports population in Gansu Province are investigated by mathematical statistics and MATLAB simulation. It provides a reference for the study of urban physical exercise population in Gansu Province. The simulation results verify the feasibility and effectiveness of the parameter system identification method of the urban physical exercise population in Gansu Province, which has important application and reference value in the theoretical research of scientific research. In order to promote the harmonious development of all social strata, we should establish the correct orientation of gender value and strengthen the construction of sports ecological environment.

6. Countermeasures and suggestions
(1) Establish a fair and reasonable distribution system and increase the proportion of sports population
The government must take various effective measures to narrow the gap between social classes, prevent polarization, and enable more people to participate in physical exercises and integrate into the community. Increase the proportion of sports population.

(2) Promote education equity, strengthen the mobility among different levels, and promote the balanced development of sports population of all levels

Social equity is the eternal value pursuit of human society. Educational equity is the extension and embodiment of social equity in the field of education. It is an important foundation of social equity and has the function of promoting social equality and maintaining social stability [9]. Through the mobility mechanism among different classes, we can play the role of sports ties, increase sports exchanges and communication between different classes, improve the construction of sports population among different classes, improve the quality of population, and then promote social equity and harmony.

(3) Promote the equal status of men and women and develop the proportion of men and women in sports population in a balanced way
Therefore, the government should actively construct advanced gender culture, establish correct gender value orientation, create a fair, equal and harmonious gender environment, and promote the balanced development of women's sports and men's sports.

(4) People oriented, strengthen the construction of sports environment
There are differences in sports resources enjoyed by different social strata, which results in the inequality of sports rights in fact and restricts the development of national fitness in China. Therefore, create a physical exercise environment for all sectors of society, so as to promote the healthy and harmonious development of society.
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