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## Research on chinese students the relations between blood types, types of temperament and sports

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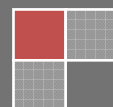
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### ABSTRACT

This study was for the 514 students of the Institute of Physical Education whose blood-type and temperament-type are relative to sports. According to our study, on the one hand, among students of the Institute of Physical Education, the percentage of the ABO blood types ranks from O-type, then A-type, then B-type, to AB-type in sequence, which is different from common people; on the other hand, there are different distribution features of blood types in different sports events. If an athlete belongs to O-type or A-type, he is more likely to have higher physical quality. If he belongs to B-type, he is not likely to do so. At the same time, the temperament types of students of the Institute of Physical Education mainly include sanguine temperament, sanguine-phlegmatic temperament, sanguine-choleric temperament, phlegmatic temperament, which shows a diverse distribution feature. Meanwhile, sanguine temperament and its mixed types share high percentage, while melancholic temperament and its mixed type share low. Students with sanguine temperament and its mixed types are more likely to stand out in each special sports event, Nowadays, the study on the relationship between blood-type, temperament and sports still stay on the surface and lack depth, although no affirmative scientific conclusion to this problem has been made till now, continuing discussions and studies are certainly worth being undertaken.

### KEYWORDS

Blood types; Specific sports; Temperament types; The sport university students; Scientific selection.



The heritability of the ABO blood types are 100%<sup>[1]</sup>, and the stability of genetic characteristics have been confirmed by Genetic theory<sup>[2]</sup>. Therefore, the blood-type has also become an important assessment factor to scientific selection of an athlete. It can be shown from the current available information that there are differing views on how much have the gene-determined ABO blood types to do with the selection athletes. Till now, no regular conclusion has been acquired about the relations between ABO blood types, temperament types and specific sports, since only a tendentious impression has been left on researchers. It is notable that there is no definite conception about what kinds of blood types and temperament types of athletes is needed in order to perform well in different specific sports. Hence further studies are needed. Based on it, we have researched about the relation between the blood types, the types of temperament and sports of 514 students of the Institute of Physical Education, so as to find out the further relationship between them, to provide some valuable experimental data to make up for the lack of relevant information available, and to provide physiological basis for scientific and accurate selection of athletes and the directed development of athletes in the future.

## SUBJECTS AND METHODS

### Subjects

The study object are 585 students majoring in Physical education and Sports training enrolled in the Institute of Physical Education of Ningbo University 2010, 2011, 2012 and 2013, among which 514 students are taken as valid samples, occupying 87.86% with 403 males and 111 females.

### Methods

#### Blood grouping test

ABO blood types test, the most common blood-type test, is adopted in this research. With the plasma provided by Ningbo Central Blood Bank, we can know the students' blood types.

#### Temperament types test

The "temperament--type test survey"<sup>[3]</sup>, introduced by CHENG Huichang, researcher of Institute of Social Psychology in China, is used to determine the students temperament-type. The survey includes 60 questions. The temperament types are classified by the scores. It has been stated by quite a few researches that this survey is trustable and efficient. In this test the cronback is between 0.72 and 0.87.

#### Ad hoc survey

The students majoring in sports training are categorized by the specific sports. The others are categorized by the items they attained in the Provincial university students' Games and Provincial Games, such as Sprint, middle-distance race, throwing, jumping (long jump, high jump), basketball, football, volleyball, martial arts, gymnastics, aerobics and so on.

#### Data processing

SPSS19.0 software is adopted to categorize, statistics and process the valid data

## FINDINGS AND ANALYSES

### Blood-type distribution comparison between students of the institute of physical education and the common person

**TABLE 1 : Blood-type distribution comparison between students of the institute of physical education and the common person**

groups	O-type %	Number	A-type %	Number	B-type %	Number	AB-type %	Number	Total	X <sup>2</sup> test
Normal person <sup>[4]</sup>	30.49	12083	27.51	10902	32.33	12810	9.67	3831	39626	
students	37.35	192	30.16	155	24.51	126	7.98	41	514	X <sup>2</sup> =20.47
X <sup>2</sup>	11.253		1.777		14.184		1.665			P<0.01
P	<0.05		>0.05		<0.01		>0.05			

As shown in TABLE 1, among the common person, the percentage of blood types ranks from B-type, O-type, A-type, to AB-type in sequence, while that of the physical education students ranks from O-type, A-type, B-type, to AB-type in sequence. This result is accordant with the most of the results which the domestic and aboard researchers have got. But some others agree with the turn of A-type, O-type, B-type, AB-type.<sup>[5,6]</sup> In one word, there is not an identical agreement about the distribution of the ABO blood type. It varied with study objects, such as the ethnic, region and level.

The percentage of O-blood-type students in the Institute of Physical Education is 37.35% and A-blood-type is 30.16% which are 6.86 and 2.65 higher than the common person respectively. By analyzing the two kinds of O-blood-type ( $X^2=11.253$ ,  $P<0.05$ ), an obvious difference can be seen. The percentage of B-blood-type students in the Institute of Physical Education is 24.51% and AB-blood-type is 7.89% which are 7.82 and 1.69 lower than the common person respectively. In addition, the B-blood-type percentage comparison between the students of Physical Education Department and the common person is extremely different with ( $X^2=14.184$ ,  $P<0.01$ ) Other blood types don't have much differences, when comparing students in the Institute of Physical Education and the common person.

**Blood-type distribution comparison between students in the school of physical education and the athletes**

**TABLE 2 : Blood-type distribution comparison between students of the school of physical education and athletes**

Groups	O-type.	Number	A-type.	Number	B-type.	Number	AB-type.	Number	Total	X <sup>2</sup> Test
athletes <sup>[7]</sup>	33.70	138	30	123	25.60	105	10.70	44	410	
students	37.35	192	30.16	155	24.51	126	7.98	41	514	X <sup>2</sup> =5.966
X <sup>2</sup>	1.357		0.003		0.146		2.073			P>0.05
P	>0.05		>0.05		>0.05		>0.05			

As shown in TABLE 2, the blood type percentage distribution in students of the Institute of Physical Education is accordant with the excellent athletes, the sequence from the higher to the lower is: O-type, A-type, B-type, AB-type, with  $X^2=5.966$ ,  $P>0.05$ . Also there are no quite difference for each blood- type with  $P>0.05$ .

From TABLE 1 and TABLE 2 we can know that there are about 3.8% more O-blood -type and A-blood-type students in the Institute of Physical Education and athletes than the common person. On the other hand, there are 7.2% less for B-blood-type. This reveals the relationship between the blood -type and the quality of the athletes. Comparing the O-type with the A-type, it can be known that O-type has more tight relationship with the quality of the athletes. This result is accordant with the former research. For example, in 1980 and 1988, Li Yue-ling and her group found out that, averagely, there are 3% more A-blood-type and O-blood-type in the athletes than that in the Han ethnic group Chinese. On the other hand, there are 6% less for B-blood-type. The ABO-type distribution of Africa-America athletes is O-type 49.3%、 A-type 26.0%、 B-type 21.0%、 AB-type 3.7%. In England, the it is O-type 46.7%、 A-type 41.7%、 B-type 8.6%、 AB-type 3% ; In the athletes took part in the 10th Asian Games holding in China, the ABO-type distribution is : O-type 61.57%、 A-type 18.20%、 B-type 14.68%、 AB-type 5.55%.

**Comparison and investigation of the blood-type distribution in the specific sports of students in the school of physical education**

**TABLE 3 : Comparison the blood-type distribution percentage between specific sports groups and 514 students in the school of physical education**

Items Number	O-type.	Number	A-type.	Number	B-type.	Number	AB-type%	Number	X <sup>2</sup>	P
Students 514	37.35	192	30.16	155	24.51	126	7.98	41		
Basketball 121	32.23	39	36.36	44	23.14	28	8.27	10	2.502	>0.05
Volleyball 28	39.29	11	28.57	8	25.00	7	7.14	2	3.329	>0.05
Football 78	47.44	37	30.77	24	15.38	12	6.41	5	5.024	>0.05
Sprint 59	45.76	27	20.03	13	23.73	14	8.47	5	2.441	>0.05
Middle-distance race 51	37.26	19	29.41	15	21.57	11	11.76	6	1.814	>0.05
Jumping 42	23.81	10	35.71	15	30.95	13	9.52	4	1.107	>0.05
Throwing 32	37.50	12	18.75	6	37.50	12	6.25	2	0.078	>0.05
Martial arts 39	41.03	16	20.51	8	28.21	11	10.26	4	3.702	>0.05
Gymnastics 24	37.50	9	20.83	5	29.17	7	12.5	3	1.519	>0.05
Aerobics 40	30.00	12	42.50	17	27.50	11	0	0	5.691	>0.05

**Notes : Jumping includes long jump and high jump**

As shown in TABLE 3, relating the blood-type to the specific sports, the percentage distribution from higher to lower is O-type, B-type, A-type, AB-type for Sprint, Martial arts, gymnastics. While for football, middle-distance race, volleyball in turn is O-type, A-type, B-type, AB-type, and A-type, O-type, B-type, AB-type for aerobics, A-type、 B-type,

O-type, AB-type for jumping. The blood-type percentage distribution of the specific sports is not quite different with the total students'. It might be because our school student is lower in physical fitness and overall sports performance is not so prominent.

The relationship between the blood- types and the specific sports has always attracted much attention of researchers. There are different opinions. That O –blood-type person is more bravely, aggressive, powerful and good at jumping is generally accepted. They have high possibility to get excellent achievements in football, sumo and track and field but in Long-- distance sports. From TABLE 3, we can know that, except jumping and aerobics, the O-type has high percentage in all other groups. For the Power projects such as Volleyball, soccer, sprinting, throwing, Martial arts and gymnastics requires strength, the percentage of O-type is obviously higher than other groups, especially in Soccer, sprint, martial arts which is over 41%. Although the low percentage of O-type can be easily found in the Jumping Group, there aren't notable discrepancies compared with other groups. On the whole, the above findings are identical with the previous study conducted by other scholars. However, it is noticeable that the superior position of the O-type in the Jumping Group hasn't been set up while the inferior position of the O-type in the Long Distance Group hasn't been proved yet. Based on his study, Mr.Xie holds that A-blood-type person, whose waist is quite flexible and elastic, is to endure hardships and be capable of hard work. The B-blood-type persons who is bold and quick in movements, has a strong desire for victory. But he is fit for individual events because of his weakness in cooperation with others. As to the AB-blood-type person, who has a cool and calm mind and who is quick in action can keep long and lasting attention on a subject but can't do well in diverting his attention. According to our study, the percentage of A-blood-type student ranks higher in Basketball Group, Jumping Group and Aerobatics Group than that in other groups, while in the rest groups, A-blood-type students don't make a big difference from other students, nor do they hold superior position in the sports events that require endurance. Meanwhile, the percentage of B-blood-type students ranks the first place in Throwing Group, the second in Jumping Group, the third in Gymnastic Group and the fourth in Martial arts Group. It seems from the result that B-blood-type person is quite fit for individual events and not so fit for collective events requiring cooperation. When it comes to the AB-blood-type students, there is a quite difference: Neither their superior position nor their inferior position in every group that can be shown through our study, although they are said to be superior in speed quality from Mr. Xie's study. Compared with the findings of the study of excellent athletes' blood types, our study also holds differing findings.

#### The temperament-type distribution in the department of physical education students

TABLE 4 : The temperament-type distribution in the students in the school of physical education

Temperament --type	Choleric	Sanguine	Phlegmatic	Melancholic	Sanguine --choleric	Sanguine -- phlegmatic	Sanguine -- melancholic	phlegmatic - melancholic	Choleric -- phlegmatic	Choleric - melancholic
Number	25	167	52	18	82	92	16	26	21	15
%	4.86	32.49	10.12	3.50	15.95	17.90	3.11	5.06	4.09	2.92

As shown in TABLE 4, there are different temperament types in the students of Physical Education Department, including sanguine temperament, sanguine—phlegmatic, sanguine-choleric, choleric temperament. There are 50.97% of the students have mixed temperate types and 49.03% of the students have single temperate types. With32.49%,the sanguine temperament holds the highest percentage, followed by sanguine -phlegmatic (17.90%), sanguine-choleric (15.95%), melancholic and melancholic mixed temperament in turn from high to low.

#### Comparison and distribution of the students' temperate types and blood types in physical education department

From the results that the domestic and aboard researchers have got, we can conclude that the temperament type is determined by the blood-type. The Blood-type phenomenon has relationship with the individual physiology and biochemistry function. The blood-type substance varies from person to person, so the function and character are different, as well as the temperament.

As shown in TABLE 5, the sanguine temperament has the highest percentage while the melancholic has the lowest percentage for each blood-type. For O-type, A-type, and B-blood-type, the turn is sanguine, sanguine-phlegmatic, sanguine-choleric from high to low, as for AB-blood-type the turn is sanguine, sanguine-choleric, sanguine-phlegmatic temperament. In sanguine temperament group, there is less B-blood-type. In choleric temperament and choleric-phlegmatic group, there is more A-blood-type than other blood-type and less B-blood-type than other blood type. For phlegmatic temperament the distribution turn is O-type, B-type, A-type, and AB-type from more to less. From the research result we can know that blood-type and temperate have some relationship. Since we have limited number of the test objects so that we cannot find out the obvious and clear relationship in this paper. Further researches need to done to get the exact relationship which can help the students to choose their specialized training of sports. Nevertheless, when it comes to the selection and training of athletes,

the research conclusions respectively can be referenced, which might be more beneficial to the grow-up and development of athletes.

**TABLE 5 : Comparison and distribution of the temperament types and blood types of students in the school of physical education**

Temperament-type	O-blood-type		A-blood-type		B-type blood		AB-blood-type	
	Number	%	Number	%	Number	%	Number	%
Choleric	8	4.17	9	5.81	5	3.97	3	7.32
Sanguine	66	34.38	50	32.26	37	29.37	14	34.15
Phlegmatic	18	9.38	11	7.10	17	13.49	6	14.63
Melancholic	7	3.65	5	3.23	6	4.76	0	0
sanguine-choleric	30	15.63	22	14.19	23	18.25	7	17.07
sanguine-phlegmatic	35	18.23	27	17.42	24	19.05	6	14.63
sanguine-melancholic	3	1.56	9	5.81	3	2.38	1	2.44
phlegmatic-melancholic	10	5.21	9	5.81	5	3.97	2	4.88
choleric-phlegmatic	7	3.56	9	5.81	3	2.38	2	4.88
choleric-melancholic	8	4.17	4	2.58	3	2.38	0	0

### CONCLUSION

On the one hand, in the School of Physical Education, the percentage of the ABO blood-types ranks from O-type, then A-type, then B-type, to AB-type in sequence, this is different from common people. On the other hand, there are different distribution features of blood types in different sports events. If an athlete belongs to O-type or A-type, he is more likely to have higher physical quality. If he belongs to B-type, he is not likely to do so. Therefore, if there is no fundamental change in all the other conditions, we hold the following tendentious opinion: it is better for us to select the athletes of O-type and A-type. The temperament types of students in the School of Physical Education mainly include sanguine temperament, sanguine-phlegmatic temperament, sanguine-choleric temperament, phlegmatic temperament, which shows a diverse distribution feature. Meanwhile, when ABO blood types are taken into consideration, sanguine temperament and its mixed types share high percentage, while melancholic temperament and its mixed type share low. Students with sanguine temperament and its mixed types are more likely to stand out in each special sports event, which suggests that we should select athletes with mixed temperament-type, in particular, sanguine temperament and its mixed types so as to make up for the defect of single temperament-type. It can be seen from our study that there might be some internal relations between ABO blood-types and specific sports, which are interrelated and interacting. Athletes who work on different specific sports might show respective features in their blood type distribution. Although definite and scientific conclusions still can't be made about these problems, for the objects of study, whose vary in races, regions, and ranks, has brought about the different results, continuing efforts and explorations can be made. It is firmly believed that people will have more revelations and deeper understandings about those problems with the development of scientific technology. What's more, the meaning of blood-type has enlarged from ABO-type to the differences that white blood cell, blood platelet, etc has shown in antigen, which provides more extensive methods to select athletes. Despite of its several hundred years' applications in medical field, blood-type has just made initial steps in PE field. Till now, researchers have made many investigations about the relations between blood types and psychology parameters, especially the Japanese scholars, who have made headways and gained abundant achievements. Nevertheless, the study on relations of blood types, temperament types and specific sports is still limited to the level of descry emend over the issue and some even hold sharply different opinions. Some believe that one's blood-type has a lot to do with one's behavior, physical quality and temperament. Oppositely, some hold that one's blood type has nothing to do with those aspects. We assert that there is certain one-sidedness in the studies of scholars, domestic and aboard, whose research fields and contents of samples are far from complete preciseness, whose viewpoints and proposals still require further studies and investigations. The conclusions that they are related or they have distinct significance bear no universal meaning, because the data and percentages by which conclusions are made are just acquired from questionnaire testing. For this reason, when one is required to select athletes scientifically, one should not make abrupt conclusions, such as some blood-type and temperament-type meet the needs of specific sport while some don't. One needs to think twice.

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