

# Race and athletic performance: 2015 sports data analysis

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**Abstract:** Using methods such as literature review, statistical analysis, and logical reasoning, this study analyzes the influence of race on athletic performance based on data from three major competitions. It concludes that there are disparities among different races in terms of biological genetics and social backgrounds, as well as variations in the technical characteristics of different sports. The findings indicate that Black athletes have a significant advantage in track and field events, White athletes excel in swimming and strength-based sports, while Asian athletes perform well in skill-based events.

**Keywords:** Race, Athletic Performance, Sociology, Sports Science, Economics

## 1. Introduction

Following the 2015 Sudirman Cup World Badminton Mixed Team Championships held in Dongguan, China in May, two highly anticipated events, the Kazan Swimming World Championships and the Beijing World Athletics Championships, took place in August, providing sports enthusiasts with a world-class visual feast. However, while enjoying the exciting competitions, the "unique scenery" on the podium also provokes thought: Caucasian, Black, and Asian athletes seem to "dominate" the swimming championships, athletics world championships, and badminton courts, respectively. Reviewing the results of these three major events over the past decade, the pattern is almost the same.

From the aforementioned "unique scenery," it is evident that there are differences among different races in competitive sports. To further understand these differences, this article will focus on the racial distribution of athletes who won awards in these three major competitions, using data provided by the official websites of the three events to analyze the distribution and differences in the racial composition of the award-winning athletes. Based on this analysis, relevant suggestions will be proposed to promote the development of competitive sports in our country.

## 2. Research object and methods

### 2.1. Research object

The study focuses on the racial distribution of athletes who won awards in the Kazan Swimming World Championships, Sudirman Cup World Badminton Mixed Team Championships, and Beijing World Athletics Championships.

### 2.2. Research methods

#### 2.2.1. Literature review method

This paper reviewed nearly 50 articles on China National Knowledge Infrastructure (CNKI) using keywords such as "race," "competitive sports," "sports performance," and "sociology." After analyzing the relevant important literature, the theories and deficiencies were synthesized and summarized, providing a theoretical basis for this study.

#### 2.2.2. Statistical method

Conventional statistical methods are used to organize and present the data found and derived through charts and graphs.

### 2.2.3. Logical analysis method

Based on a comprehensive understanding of the relationship between race and sports, this paper employs analytical induction to logically analyze the history of race and competitive sports. It summarizes, analyzes, and synthesizes the evolutionary characteristics, significant issues, and existing problems in the development process to ensure the rigor of the paper's logic and the accuracy of its conclusions. Further discussion on the relationship between race and competitive sports is provided, and constructive suggestions for the development of competitive sports in our country are offered based on these relationships.

## 3. Research results

### 3.1. Statistical results of award winners and proportions in each event of the three major competitions in 2015

Table 1: Statistical Results of Award Winners in Each Event at the 2015 World Athletics Championships

	100m	1500m	10000m	400 Hurdles	3000 Steeplechase	Marathon	High Jump	Shot Put	Race Walk	Proportion
Mongoloid race	0	0	0	0	0	0	1	1	3	9%
Caucasian race	1	0	1	2	2	0	5	3	3	32%
Black race	5	6	5	4	4	6	0	2	0	59%

From Table 1, it is evident that the Black race accounts for 59% of the total medal winners, primarily in running events. The White race accounts for 32% of the total medal winners, mainly in jumping and strength events. The Mongoloid race accounts for 9% of the total medal winners, predominantly in walking events.

Table 2: Statistical Results of Award Winners in Each Event at the 2015 World Swimming Championships

	100m Freestyle	1500m Freestyle	100m Backstroke	100m Breaststroke	100m Butterfly	200m Individual Medley	1m Platform (Solo)	10m Platform (Solo)	Open Water 5km	Proportion
Mongoloid race	1	1	0	0	1	2	3	3	0	20%
Caucasian race	5	5	6	6	5	4	3	3	6	80%
Black race	0	0	0	0	0	0	0	0	0	0

From Table 2, it is observed that the Black race has a medal count proportion of 0%. The White race accounts for 80% of the total medal winners, primarily in swimming events. The Mongoloid race accounts for 20% of the total medal winners, mainly in diving events.

From Table 3, it is known that in this competition, the Mongoloid race countries swept the top three positions.

Table 3: 2015 Sudirman Cup Award-Winning Countries Statistical Results

Champion	Runner-up	Third Place	Champion
Award-Winning Country	China	Japan	Award-Winning Country
(Mongoloid race)	(Mongoloid race)	(Mongoloid race)	(Mongoloid race)

### 3.2. Statistical results of award winners and proportions in each event of the three major competitions over the past decade

Table 4: Statistical Results of Award Winners in Each Event at the World Athletics Championships from 2007 to 2015

	100m	1500m	10000m	400 Hurdles	3000 Steeplechase	Marathon	High Jump	Shot Put	Race Walk	Proportion
Mongoloid race	0	0	0	0	0	5	1	3	8	6%
Caucasian race	1	8	1	14	8	2	28	25	22	41%
Black race	29	22	29	16	22	23	1	2	0	53%

From Table 4, it can be seen that the Black race tends to win a higher number of medals in running events, the White race has a higher number of medal winners in jumping, strength, and racewalking events, and the Mongoloid race has a relatively lower number of medal winners across all events.

Table 5: Statistical Results of Award Winners in Each Event at the World Swimming Championships from 2007 to 2015

	100m	1500m	10000m	400 Hurdles	3000 Steeplechase	Marathon	High Jump	Shot Put	Race Walk	Proportion
Mongoloid race	1	6	5	2	4	3	17	17	0	21%
Caucasian race	29	24	25	28	26	27	13	13	30	79%
Black race	0	0	0	0	0	0	0	0	0	0

From Table 5, it can be observed that the White race has a higher number of medal winners in swimming events, the Mongoloid race has a higher number of medal winners in diving events, and the Black race has no medal winners in swimming events.

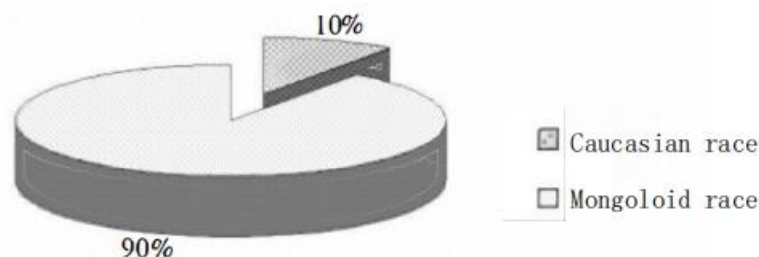


Figure 1: Racial Proportion of Badminton Award-Winning Countries from 2007 to 2015

Data from Figure 1 indicates that from 2007 to 2015, athletes of the Mongoloid race accounted for 90% of the total number of award-winning athletes in the Sudirman Cup Badminton Championships. The White race accounted for 10%, and athletes of the Black race did not win any awards in the past decade.

## **4. Analysis of technical characteristics in major competitions**

### **4.1. Analysis of Ttechnical characteristics in track and field sports**

The technical aspects of track and field sports primarily involve the effective use of physical capabilities to actively complete running, jumping, and throwing methods. In track and field, rational movements should conform to the laws of mechanics, human anatomy, and human physiology. The composition of track and field techniques stems from various factors. From the perspective of sports anatomy, the different structures of human muscles and skeletons mean that there are certain limitations to the forms of movement exhibited during track and field activities. To achieve the goals of speed, height, and distance in track and field, movements must align with the structure and characteristics of human bones and muscles. From the viewpoint of sports biomechanics, track and field techniques must adhere to the principles of human mechanics. In terms of sports physiology, track and field techniques should also follow the principle of energy conservation, being adept at relaxation and energy saving in long-distance running. Additionally, movements should maintain effectiveness, which is an important reason to ensure the practicality of the actions. The control and regulatory capabilities of the nervous system also play an extremely important role in track and field sports. Track and field events, within the system of event groups, belong to the category dominated by physical fitness, where throwing and jumping events are classified as rapid power, short-distance running as speed, and middle to long-distance walking and running as endurance. [1]

### **4.2. Analysis of technical characteristics in swimming**

Swimming technique primarily involves leveraging the natural properties of water while coordinating one's body movements to facilitate movement through the water. Breaststroke technique can be broadly categorized into two technical schools: the "flat" breaststroke and the "wave" breaststroke. Modern technical characteristics are divided into three points: First, to minimize the impact of leg retraction speed on progression, the technical aspect of the legs is crucial. The variation in swimming speed is mainly dependent on the magnitude of leg strength. There is an instantaneous "pause" phenomenon when the legs are retracted because the amplitude of the retraction is too large, and the retraction movement is counter to the direction of movement, which athletes generally find hard to avoid. Therefore, the key to swimming performance lies in the size of the resistance encountered during leg retraction. Second, the effectiveness of the arm stroke is emphasized; swimmers typically use correct arm stroke postures and reasonable stroke counts to minimize water resistance, thereby increasing swimming speed. Third, complete coordination of techniques ensures stable speed. In the theoretical system of event groups, swimming is mainly divided into physical dominance and skill dominance categories, with short-distance swimming belonging to speed and middle to long-distance swimming belonging to endurance. Diving and synchronized swimming belong to the difficulty and aesthetics category.

### **4.3. Analysis of technical characteristics in badminton**

Badminton technique is mainly divided into footwork and hand skills. The technical characteristics are primarily the flexibility, speed, and all-round nature of footwork, and the flexibility, suddenness, and consistency of hand skills. Badminton footwork consists of five basic steps: the shuffle step, side step, crossover step, lunge step, and jump step. These five basic steps form comprehensive movement across the badminton court, and only with flexible use of footwork can one take the initiative in the match. Otherwise, slow footwork will put oneself in a passive position. In addition, the consistency and suddenness of hand skills complement the flexible and fast footwork. Whether it is high, drop, or smash shots from the backcourt, or net plays, pushes, and hooks from the frontcourt, the body posture, preparation posture, and initial racket movement should be as identical as possible to meet the requirement of action consistency. Under the condition of hand skill consistency, the flexible use of finger joints' power and their coordination can make hand skills sudden. Ultimately, this leads to the opponent making incorrect judgments and losing

points. Badminton, as a sport, mainly belongs to the skill-dominant category of net competitive within the theoretical system of event groups.

## **5. Analysis of the biological genetic background of races in major competitions**

### **5.1. Analysis of the biological genetic background of the black race**

Black individuals typically have shorter torsos and longer limbs, with long upper arms and thick thighs, while their calves are slender. Due to their longer lower limbs, Black individuals have a higher center of gravity compared to other races, which reduces their stability angle and benefits quick and agile movements. The length of the calves is advantageous for running, allowing for greater linear speed at the extremities, which aids in pushing off the ground to generate a larger reactive force. Additionally, the upward-tilted buttocks of Black individuals are believed by many experts to enhance explosive power, improving sprinting and jumping abilities. This upward tilt increases the length of the muscles in the buttocks and legs, generating greater force during contraction, which is transmitted to the ground. The elongation of muscles stimulates the central nervous system, preparing it to send stronger contraction signals, and the stretched muscles can gain initial speed due to the stretch reflex.

The foot structure of Black individuals differs from that of other races; typically, the longest toe is the big toe in most people, but for Black individuals, it is the second toe. They also have larger heel bones and high arches, along with thick, fleshy soles, making their feet resemble elastic boots that enhance landing shock absorption. Black individuals have longer Achilles tendons and well-developed lower leg muscles, contributing to greater muscle strength in the foot.

The black skin of Black individuals contains a large amount of melanin, which reduces the harmful effects of ultraviolet rays, while their curly and fluffy hair helps protect the scalp from high temperatures. The broad lips, short and wide nasal cavities, and well-developed sweat glands facilitate heat dissipation and temperature regulation. The fast-twitch muscle fibers in Black individuals are relatively more abundant than in the other two races, which is evident in the dominance of Black athletes on the podium in the 100-meter events over the past decade.

Moreover, Black individuals have a lower fat percentage compared to the other two races, which results in reduced buoyancy, making swimming more challenging. This is a significant reason why Black athletes have not performed well in world swimming competitions, as reflected in the absence of Black medalists in the swimming events over the past decade. The blood vessels of Black individuals are thicker than those of Yellow and White individuals, enhancing their ability to transport oxygen and nutrients. Consequently, in the marathon events at the World Athletics Championships over the past decade, nearly all athletes were Black, highlighting their inherent advantages in endurance sports.

### **5.2. Analysis of the biological genetic background of the white race**

White individuals tend to have larger frames, broad shoulders, long arms, and large feet, coupled with strong explosive power and large lung capacity. Additionally, the proportion of body fat in White individuals is relatively higher compared to the other two races, providing greater buoyancy in water. In swimming, broader shoulders can increase propulsion speed and extend the glide distance of the swimmer.[4] The speed in swimming is closely related to the stretchability of the swimmer's body, and with arms extended forward during swimming, broader shoulders can ensure more expansive and effective movements. Feet are an important component for swimmers, as they can increase propulsion speed; large feet can enhance swimming velocity, and the force exerted by the feet during starts and turns, both on land and in water, can propel swimmers further.

### **5.3. Analysis of the biological genetic background of the mongoloid race**

Individuals of the Mongoloid race are generally shorter and lighter in weight, and they do not have advantages in absolute strength or speed. Their innate talents are primarily concentrated in projects related to agility, skill, and mental faculties. Therefore, Yellow individuals have a significant advantage in skill-dominant events, and badminton is one such event. As shown in Figure 1, 90% of the award-winning countries are of the Mongoloid race. Additionally, in the diving events of the swimming world

championships over the past decade, out of 60 medal-winning athletes, 34 were of the Mongoloid race. This is because diving is categorized as a skill-dominant event within the theoretical system of event groups. In terms of height and weight, Yellow individuals are significantly behind White individuals, a characteristic that greatly limits their running speed and jumping ability. As a result, they are at a disadvantage in track and field and team sports but provide an advantage for agility-required events such as badminton and gymnastics.

## **6. Sociological background analysis of races in major competitions**

### **6.1. Sociological background analysis of the black race**

The Black race is primarily distributed in Africa and the Americas. The economic level in Africa is relatively underdeveloped, making it difficult to construct sports facilities, which hinders the promotion of sports like swimming and badminton. As a result, it is rare to see Black athletes in the Sudirman Cup and swimming world championships over the past decade.[5] The region has poor transportation infrastructure, and Black individuals are accustomed to long-distance running during labor, which is beneficial for track and field events, especially long-distance running. We can see that Ethiopian Black athletes often rank in the top three positions. Politically, the region is unstable, and the basic rights of Black individuals are not guaranteed, making it difficult for them to engage in sports. Culturally, the region still practices hunting culture, so Black individuals often run and chase for hunting purposes. Climate-wise, the region is in the tropics, and Black individuals are accustomed to exercising in hot climates with strong body heat dissipation functions. The region also has a tropical desert climate with scarce rainfall and severe water resource shortages, which limits the development of swimming sports in Africa.[6] In the Americas, the competitive level is relatively high, living facilities are better, and sports facilities are more complete. Therefore, Black individuals in this region have been exposed to new sports and have reached the pinnacle in certain events by leveraging their racial advantages. Politically, due to racial discrimination against Black individuals in the Americas, they use their racial advantages to shine in sports, which helps to improve their social status. Culturally, the humanistic thought in the Americas emphasizes the role of individuals, where everyone has the right to strive for improvement. We can see that there are many Black athletes in the United States who have won rankings.

### **6.2. Sociological background analysis of the white race**

The White race is primarily distributed in Europe and the Americas. Economically, the highly developed capitalism has led to the establishment of various sports leagues, which have increased national income and allowed countries to further improve their sports facilities. This has led to a higher level of public participation in sports, a strong sports culture, and a rich promotion of sports activities. Politically, in the capitalist countries where the White race is distributed, the class nature of these states determines that sports have a capitalist character, leading to unprecedented commercialization of sports and promoting the spread of various sports. There are not too many sports management institutions established by the state; most are set up independently by civilian sports enthusiasts, which greatly increases public interest in sports. The bourgeoisie holds the leadership of the state and determines sports policies. Governments encourage the development of the sports industry, have a complete sports league mechanism, host most top-tier sports leagues, and actively promote and encourage national sports participation through sports sponsorship. As a result, we can see White athletes in swimming, track and field, and badminton competitions, which is inseparable from their comprehensive sports league mechanism. In terms of religion and culture, humanistic thought and individual heroism encourage everyone to strengthen their bodies and exercise. Additionally, religious freedom in the region and the absence of religious conflicts provide a stable social environment for the development of sports. Climate-wise, the region is generally in a temperate or cold temperate zone, so White individuals in this area tend to be larger, have a higher body fat ratio, and are relatively stronger. In Table 2, 79% of the award-winning athletes in the swimming world championships over the past decade were White athletes.

### 6.3. Sociological background analysis of the mongoloid race

The Mongoloid race is mainly distributed in Asia. Economically, the region has established economic cooperation organizations such as ASEAN and the Asia-Pacific Economic Cooperation, which have promoted economic development in the region and provided countries with more income to develop sports. Politically, as a strong sports nation in Asia, China's socialist nature determines that sports always serve the people, with the slogan "Develop sports, enhance people's physical fitness." The socialist system facilitates the concentration of all favorable national resources to develop sports, such as the establishment of the State General Administration of Sports and various provincial sports bureaus managing different sports, and the creation of various complete competitions. This not only meets the spiritual and cultural needs of the people but also has a reverse effect on economic development, further consolidating the relationship between politics, economy, and sports. In terms of religion and culture, freedom of religious belief in various countries and the absence of religious conflicts provide a stable social environment for the development of sports. The traditional sports spirit of some countries has also made a significant contribution to the inheritance and promotion of sports, such as China's traditional martial virtues, South Korea's taekwondo, and Japan's samurai spirit. Climate-wise, the region is generally in a subtropical or tropical area with a relatively hot climate and long and abundant rainfall, which limits the development of outdoor sports in the region. However, the abundant water resources also provide some convenience for swimming sports.

## 7. Conclusion and recommendations

### 7.1. Conclusion

The Black race has a significant advantage in track and field events and team sports, the White race excels in swimming and strength-based events, while the Mongoloid race has a strong presence in skill-based events. [4] There are racial differences in competitive sports, and the main reasons for these differences include biological heredity, social background disparities, and the technical characteristics of various sports.

### 7.2. Recommendations

Efforts should be made to improve the physical fitness of the entire population. Competitive sports are a form of national competition, representing the physical capabilities of different ethnic groups. Only by enhancing the overall fitness of the population can we elevate competitive levels. The purpose of vigorously promoting mass sports activities is to improve the physical fitness of all citizens and promote overall health. As the physical fitness of the population increases, the level of competitive sports will also improve.

Scientific selection and training are essential. Enhancing competitive levels must rely on scientific methods, particularly strengthening collaboration among different disciplines, such as sports, medicine, physics, and the humanities. By working together to identify and nurture reserve talents, and with scientific training, a country with a population of 1.3 billion will inevitably produce a variety of competitive talents, facilitating the transition from a sports power to a sports stronghold.

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