

# Research on the Difference of Long-term Development Self-evaluation of Badminton Players Based on Individual Characteristics

Leiming Yang

*Hunan Traditional Chinese Medicine College, Zhuzhou, Hunan, China*

**Abstract:** Self-evaluation is a key factor in the development of athletes, influencing their training outcomes and competition performance. With the increasing popularity of sports, particularly badminton, more research has begun to focus on the role of self-evaluation and its influencing factors. This paper aims to analyze the differences in long-term self-evaluation among athletes based on gender, academic background, and years of sports experience, thereby providing a theoretical basis for coaches to develop targeted training programs. By examining various dimensions such as fundamental movement techniques, participation in multiple sports, technical progress, tactical understanding and decision-making, and psychological skills training, this study elucidates the differences in self-evaluation among athletes from different backgrounds. The findings indicate that the differences in long-term self-evaluation among athletes of varying gender, academic background, and years of sports experience are not significant, suggesting that training programs provide equitable growth opportunities for the majority. This also implies that in sports education, all participants have equal access to corresponding resources and excellent coaching. This research will not only deepen the understanding of the long-term development of badminton players but also promote the comprehensive development of athletes in training and competition, enhancing their competitive level.

**Keywords:** Personal Characteristics; Badminton Players; Long-Term Development; Differences in Self-Evaluation

## 1. Introduction

In today's society, sports not only serve as a form of leisure and entertainment but have also

become an important means of promoting health, enhancing physical fitness, and fostering teamwork. As a competitive sport, badminton attracts a large number of enthusiasts worldwide due to its unique charm and participatory nature. From amateur players to professional athletes, participants in badminton demonstrate the significance of self-evaluation in their continuous pursuit of excellence. Self-evaluation helps athletes gain a more accurate understanding of their strengths and weaknesses, and it provides guidance for their long-term development [1].

In recent years, an increasing number of studies have focused on the importance of self-evaluation in athlete development[2]. Self-evaluation refers to an individual's subjective judgment of their own abilities and performance, which plays a crucial role in sports training and competition. Higher self-evaluation is often associated with stronger self-confidence, a more positive training attitude, and better athletic performance[3]. When facing competitive challenges, how athletes reflect on themselves, adjust their goals, and formulate training strategies are all key factors influenced by self-evaluation.

Adaptive leadership strategies refer to leaders flexibly adjusting their leadership styles based on environmental and individual needs to promote the development of teams and individuals. In the realm of sports, coaches bear the responsibility of nurturing athletes, and adaptive leadership strategies significantly impact athletes' growth and performance. Coaches must adopt different guidance methods according to the individual differences and developmental stages of athletes to effectively enhance their self-evaluation levels, thereby promoting their long-term development. Therefore, studying the role of adaptive leadership strategies in the self-evaluation of badminton players becomes particularly

important[4].

In badminton training and competition, athletes exhibit differences across multiple dimensions. These differences stem not only from gender, academic backgrounds, and years of athletic experience but also manifest in their fundamental technical skills, participation in multiple sports, technical progression, tactical understanding and decision-making, as well as psychological skills training. The differences in self-evaluation among athletes from various backgrounds directly affect their training outcomes and competition performance[1]. Thus, understanding and analyzing these differences is crucial for developing scientific training programs, improving athletes' performance, and enhancing their self-confidence.

In summary, this paper studies the differences in athletes' evaluations of their long-term development based on the personal characteristics of badminton players. It will systematically analyze the differences in self-evaluation among athletes of different genders, academic courses, and years of experience across various dimensions, including fundamental technical skills, participation in multiple sports, technical advancement, tactical understanding and decision-making, and psychological skills training. This research not only contributes to a deeper understanding of the long-term development of badminton players but also provides scientific evidence for coaches when formulating personalized training plans, ultimately promoting the comprehensive development of athletes in training and competition.

## 2. Methodology

### 2.1 Study Participants

To ensure that the sample of badminton players recruited for this study is representative, this paper employs a stratified sampling method to recruit 323 research subjects from five higher education institutions in China. The individual characteristics of the recruited badminton players are distinguished, including the gender of the athletes, their academic programs, and the years as a badminton player. This distinction is made to ensure that the survey subjects have equal representation in terms of gender, specialization, and sports experience. The sample size for each category is determined based on statistical considerations, and

participants are recruited through a simple random sampling method. The specific numbers are shown in Table 1.

**Table 1. Frequencies and Percentage of Demographic Factors**

<b>College/University</b>	<b>Counts</b>
Hunan University of Technology	65
Hunan University of Technology	68
Hunan University	65
Xiangtan University	66
Hunan University of Science and Technology	59
<b>Sex</b>	<b>Counts</b>
Female	129
Male	194
<b>Academic Programs</b>	<b>Counts</b>
Business Administration	21
Education	37
Engineering	61
Health Sciences	95
Humanities/Social Sciences	27
Natural Sciences	60
Other	22
<b>Years as a Badminton Player</b>	<b>Counts</b>
1-3 years	66
4-6 years	37
7-10 years	14
Less than 1 year	177
More than 10 years	29

### 2.2 Research Methods

In this study, a questionnaire survey was used to collect the differences of badminton players' self-evaluation on their long-term development in the sport. Various methods, including descriptive statistics, comparisons, and predictions, are used to examine the differences in these evaluations, explore athletes' perceptions of flexible leadership styles, and understand how they view their own performance in the sport. The subjects are badminton players from five schools in China, who participated in a survey regarding personal factors such as their gender, major, and duration of involvement in the sport.

#### 2.2.1 Questionnaire Design

Based on the research tasks, objectives, and content of this study, a substantial amount of relevant literature and materials were reviewed. The questionnaire was designed rigorously in accordance with scientific research methods and adhered strictly to the requirements of questionnaire design, resulting in a preliminary

draft of the survey. The questionnaire was specifically designed to assess several aspects of badminton players' self-evaluation regarding their long-term development in the sport, including the Foundational Movement Skills, Participation in Multiple Sports, Progressive Technical Development, Tactical Understanding and Decision-Making, and Training in Mental Skills. Each survey factor was meticulously designed to ensure the authenticity of the viewpoints, opinions, and experiences expressed by the participants.

### 2.2.2 Reliability Testing of the Questionnaire

To ensure the reliability and accuracy of the questionnaire, a comprehensive validation process was conducted. This process included expert reviewers assessing content validity and performing factor analysis to establish construct validity. Additionally, the questionnaire underwent preliminary testing with a limited sample of badminton players to evaluate its clarity, comprehensibility, and acceptability. Further modifications were made as necessary. The study aims to enhance the accuracy and consistency of the results through careful and thorough selection and use of instruments. The goal of this technique is to create a reliable tool that can effectively measure participants' perceptions and evaluations of adaptive leadership in the long-term development of badminton coaches and athletes.

#### (1) Shapiro-Wilk Test

The parametric test's compatibility with the research objectives was determined using the Shapiro-Wilk test, a statistical test that evaluates normality. When the p-value surpasses 0.05, parametric testing is implemented. It is unlikely that the data conforms to a uniform distribution when the p-values are less than 0.05. As a result, non-parametric testing is implemented.

#### (2) Shapiro-Wilk test

Both p-values obtained from the Shapiro-Wilk test are less than 0.05, suggesting that the scores are not normally distributed. Moreover, the histogram shows that the data is negatively skewed. Hence, to determine if there are substantial differences and relationships between the variables, non-parametric tests like the Mann-Whitney U, Kruskal-Wallis, and Spearman's rho correlation will be employed.

## 2.3 Statistical Treatment

This study employs statistical methods that require the use of various analytical tools to

examine the collected data. The characteristics of the research participants, including individual demographic statistics such as gender, major, and years of badminton experience, are summarized and described using descriptive statistics. To gain a comprehensive understanding of participants' evaluations of adaptive leadership strategies, we calculated various measurement methods, including means, standard deviations, frequencies, and percentages. Ultimately, we derived significant findings regarding the differences in badminton players' evaluations of coaches' adaptive leadership strategies.

## 2.4 Ethical Considerations

This study ensures that the neutrality of the researcher is maintained in the study to avoid the influence of personal or professional relationships. The privacy of participants is strictly protected, and all data is processed anonymously and stored safely. Participation in the study is voluntary and participants give informed consent based on a full understanding of the purpose and risks of the study. The study focuses on the welfare of participants and measures are taken to ensure the health and safety of athletes. The use of transparent recruitment techniques ensures equal opportunities for participants from different backgrounds and promotes sample diversity. At the same time, the study protocol was approved by the Institutional Review Board of Hunan Traditional Chinese Medicine College. The investigation was conducted in strict adherence to the ethical principles outlined in the Declaration of Helsinki.

## 3. Difference in the Assessment of the Players of their Long-Term Development in Badminton

### 3.1 Difference in the Assessment of Long-Term Development in Badminton Based on Sex

Table 2 displays the evaluation of the players' long-term progress in badminton, categorized based on their assigned gender. The Mann-Whitney U test analysis showed p-values greater than the 0.05 level of significance for foundational movement skills ( $p = 0.112$ ), multi-sport participation ( $p=0.474$ ), progressive technical development ( $p=0.749$ ), tactical understanding and decision making ( $p = 0.417$ ),

mental skills training ( $p = 0.784$ ), and overall ( $p = 0.489$ ). This suggests that the null hypothesis is accepted. Therefore, irrespective of their ascribed biological sex, the evaluation of the long-term progress of badminton players remains consistent.

The results, which show no statistically significant disparities in assessing long-term advancement in badminton depending on gender, imply a consistent efficacy of training regimens for both male and female players. The consistent use of fair coaching methods that cater to the varying requirements of all athletes, regardless of their gender, highlights the effective execution of equitable coaching procedures. The statement emphasizes the need for inclusive training methods that address the specific developmental needs of each athlete, creating an atmosphere that promotes equitable opportunities [5,6].

The absence of notable gender disparities is consistent with the ideas promoted by the International Olympic Committee (IOC), which prioritizes the significance of gender parity in sports. The IOC's endeavors, such as the Gender Equality Review Project, promote equitable representation and fair treatment in all sports areas, including coaching and athlete advancement. This method guarantees equitable assistance and equal access to resources for both

male and female athletes, essential for their comprehensive development and achievement in sports [5].

Furthermore, the results from previous initiatives conducted by England Athletics emphasize that effectively dealing with structural gender imbalances necessitates the adoption of inclusive policies as well as practical, hands-on measures. This entails cultivating a culture that embraces diversity and inclusivity, offering fair and impartial training opportunities, and guaranteeing that all athletes are adequately equipped to navigate the demands of competitive sports. The study emphasizes that providing equal assistance and opportunity is crucial in attaining equitable athletic development and enabling all athletes, irrespective of gender, to maximize their capabilities [6].

These results indicate that sports organizations and coaching programs are becoming more aware of the significance of gender parity. By establishing inclusive training settings and eliminating obstacles to participation, these programs guarantee the flourishing of athletes from all genders. This dedication to equality improves the general standard of athletics and contributes to dismantling deep-rooted gender prejudices, fostering a more inclusive and supportive culture within the athletic community.

**Table 2. Difference in the Assessment of Long-Term Development in Badminton Based on Sex**

Indicators	Sex	N	Mean	U	p	Interpretation
Foundational Movement Skills	Female	129	3.37	11212.00	0.112	Not Significant
	Male	194	3.43			
Participation in Multiple Sports	Female	129	3.41	11926.50	0.474	Not Significant
	Male	194	3.42			
Progressive Technical Development	Female	129	3.45	12251.00	0.749	Not Significant
	Male	194	3.46			
Tactical Understanding and decision-Making	Female	129	3.43	11848.00	0.417	Not Significant
	Male	194	3.46			
Training in Mental Skills	Female	129	3.49	12288.50	0.784	Not Significant
	Male	194	3.47			
Overall	Female	129	3.43	11943.50	0.489	Not Significant
	Male	194	3.45			

### 3.2 Difference in the Assessment of Long-Term Development in Badminton Based on Academic Programs

Using the Kruskal-Wallis test, it revealed a p-value that is lower than the 0.05 level of significance for participation in multiple sports ( $H = 13.10$ ;  $p = 0.042$ ), with small effect size based on the eta-squared (table 3). However,

irrespective of their academic programs, their evaluation of long-term progress in badminton in terms of fundamental movement skills ( $p = 0.780$ ), gradual technical advancement ( $p = 0.831$ ), strategic comprehension and decision-making ( $p = 0.054$ ), mental skills training ( $p = 0.508$ ), and overall performance ( $p = 0.151$ ) is identical.

The results revealed a statistically significant

disparity in the assessment of badminton players' long-term development of their involvement in many sports, as shown by a p-value of less than 0.05. Nevertheless, when taking into account the athletes' academic programs, there were no notable disparities seen in several aspects, including fundamental movement skills, technical progress, strategic understanding, mental skills training, and overall performance. The profound influence of participating in several sports on long-term development may be ascribed to the wide-ranging skill set and flexibility that players acquire via playing in different activities. Research indicates that athletes participating in numerous sports have improved cognitive flexibility and motor abilities. This leads to more significant overall athletic development and a decreased likelihood of overuse injuries often linked with specialization [7]. Furthermore, those participating in several sports frequently have enhanced psychological well-being and increased life satisfaction. This is because engaging in various sports promotes more comprehensive personal growth and improves

one's ability to cope with stress, as stated in the Applied Research in Quality of Life [8].

Conversely, the absence of notable disparities in several developmental features across different academic programs indicates a consistency in the quality and emphasis of instruction. The constancy shown in sports programs that stress overall athlete development, regardless of the players' academic background, demonstrates the efficacy of a balanced approach. It emphasizes the significance of offering equitable opportunities and resources to all athletes, enabling them to improve their technical, strategic, and mental abilities, guaranteeing that every athlete can excel in their athletic pursuits. These results highlight the crucial aspect of engaging in several sports, facilitating both physical and mental maturation, and fostering long-term athlete development. Coaches and sports educators are advised to promote participation in several sports and use a comprehensive development strategy to foster players who possess a wide range of skills and can achieve excellence in their chosen sports [9].

**Table 3. Difference in the Assessment of Long-Term Development in Badminton Based on Academic Programs**

Indicators	Academic Program	N	Mean	H	p	$\epsilon^2$	Interpretation
Foundational Movement Skills	Business Administration	21	3.48	3.23	0.780	0.01	Not Significant
	Education	37	3.41				
	Engineering	61	3.39				
	Health Sciences	95	3.40				
	Humanities/Social Sciences	27	3.36				
	Natural Sciences	60	3.40				
	Other	22	3.50				
Participation in Multiple Sports	Business Administration	21	3.60	13.10	0.042	0.04	Significant
	Education	37	3.25				
	Engineering	61	3.40				
	Health Sciences	95	3.40				
	Humanities/Social Sciences	27	3.38				
	Natural Sciences	60	3.46				
	Other	22	3.51				
Progressive Technical Development	Business Administration	21	3.45	2.82	0.831	0.01	Not Significant
	Education	37	3.40				
	Engineering	61	3.45				
	Health Sciences	95	3.45				
	Humanities/Social Sciences	27	3.44				
	Natural Sciences	60	3.52				
	Other	22	3.51				
Tactical Understanding and decision-Maki	Business Administration	21	3.49	7.64	0.054	0.01	Not Significant
	Education	37	3.29				
	Engineering	61	3.51				
	Health Sciences	95	3.41				

ng	Humanities/Social Sciences	27	3.44				
	Natural Sciences	60	3.52				
	Other	22	3.47				
Training in Mental Skills	Business Administration	21	3.52	5.29	0.508	0.02	Not Significant
	Education	37	3.42				
	Engineering	61	3.56				
	Health Sciences	95	3.42				
	Humanities/Social Sciences	27	3.45				
	Natural Sciences	60	3.52				
	Other	22	3.47				
Overall	Business Administration	21	3.51	9.43	0.151	0.03	Not Significant
	Education	37	3.35				
	Engineering	61	3.46				
	Health Sciences	95	3.42				
	Humanities/Social Sciences	27	3.41				
	Natural Sciences	60	3.48				
	Other	22	3.49				

Based on the post-hoc test, the difference in participation in multiple sports found between those badminton players from business administration and education programs ( $p = 0.016$ ). In particular, comparing the groups, those who are business administration ( $M = 3.60$ ) majors scored higher than educational majors ( $M = 3.25$ ).

The observed disparity in engagement in numerous sports between badminton players from business administration and education programs implies the presence of many influential variables (table 4). Business management students outperformed education majors in multi-sport engagement, suggesting a greater inclination or opportunity to participate in diverse physical activities. This discrepancy may be ascribed to the contrasting academic timetables, extracurricular preferences, or cultural perspectives on sports within various educational domains.

Participating in multiple sports is a means for business administration students to cultivate adaptable skills and uphold physical fitness, which are advantageous in high-pressure, competitive business environments. This involvement may also indicate a broader institutional or departmental culture that promotes different activities, seeing participation in several sports as an essential component of a comprehensive education.

On the other hand, education majors may have limited participation in various sports owing to a stricter academic framework or a concentration on specialized educational pursuits. The lower involvement percentage may also indicate a

distinct cultural or departmental focus, where physical exercise may be less extensively incorporated into their academic and recreational activities.

These disparities have wider ramifications for integrating and appreciating sports and physical activities in several academic fields. They propose the need for customized sports programs that accommodate the particular interests and timetables of students from diverse academic backgrounds. This strategy guarantees that every student, irrespective of their field of study, has equal access to the advantages of participating in many sports. These benefits include enhanced physical well-being, mental fortitude, and a comprehensive educational experience.

**Table 4. Pairwise comparisons - Participation in Multiple Sports**

Academic Programs		W	p
Business Administration	Education	-4.69	0.016

### 3.3 Difference in the Assessment of Long-Term Development in Badminton Based on Years of Experience

Since all the generated p-values are higher than the 0.05 level of significance, the researcher will accept the null hypothesis (table 5). Therefore, there is no significant difference in the assessment of the players of their long-term development in badminton in terms of foundational movement skills ( $p = 0.459$ ), multi-sport participation ( $p = 0.457$ ), progressive technical development ( $p = 0.742$ ), tactical understanding and decision-making ( $p = 0.991$ ), mental skills training ( $p = 0.856$ ), and overall ( $p$

= 0.477) when they are grouped based on their years of experience.

The results, which show no notable variations in assessing long-term progress in badminton across different areas, such as fundamental movement abilities, participation in multiple sports, technical advancement, tactical comprehension, and mental skills training, have several significant implications when categorized by years of experience.

The uniformity in assessments across all levels of expertise demonstrates a well-designed and all-encompassing training regimen that caters to every athlete's requirements, irrespective of their prior experience. The consistency mentioned above is under the concepts of the Long-Term Athlete Development (LTAD) model. This model stresses progressive and age-appropriate training methods to improve physical, mental, and emotional development at every step of an athlete's journey [10].

Furthermore, the findings indicate that individuals at both the beginner and advanced levels get comparable advantages from the training set, suggesting that the coaching

methods are all-encompassing and adaptable to all stages of skill development. It is crucial to ensure that all athletes improve their abilities and knowledge without the danger of early burnout or over-specialization. These problems are often seen in early sports specialization, as Badminton Ontario noted[11].

The absence of notable disparities also underscores the efficacy of a well-rounded training methodology incorporating foundational aptitudes with sophisticated methods and strategic comprehension. Adopting such a strategy is advantageous for developing a comprehensive athletic profile, essential for sustained performance and flexibility in competitive sports [12].

In summary, our results emphasize the significance of maintaining a varied and inclusive training environment that fosters the comprehensive growth of athletes. This strategy not only improves athletic performance but also boosts the general well-being and contentment of the players, reaffirming the need for comprehensive sports education.

**Table 5. Difference in the Assessment of Long-Term Development in Badminton Based on Years of Experience**

Indicators	Years as a Badminton Player	N	Mean	H	p	Interpretation
Foundational Movement Skills	1-3 years	66	3.45	3.62	0.459	Not Significant
	4-6 years	37	3.35			
	7-10 years	14	3.46			
	Less than 1 year	177	3.39			
	More than 10 years	29	3.50			
Participation in Multiple Sports	1-3 years	66	3.45	3.64	0.457	Not Significant
	4-6 years	37	3.43			
	7-10 years	14	3.35			
	Less than 1 year	177	3.43			
	More than 10 years	29	3.28			
Progressive Technical Development	1-3 years	66	3.43	1.97	0.742	Not Significant
	4-6 years	37	3.48			
	7-10 years	14	3.34			
	Less than 1 year	177	3.48			
	More than 10 years	29	3.40			
Tactical Understanding and decision-Making	1-3 years	66	3.44	0.28	0.991	Not Significant
	4-6 years	37	3.43			
	7-10 years	14	3.45			
	Less than 1 year	177	3.46			
	More than 10 years	29	3.42			
Training in Mental Skills	1-3 years	66	3.52	1.33	0.856	Not Significant
	4-6 years	37	3.45			
	7-10 years	14	3.39			
	Less than 1 year	177	3.47			
	More than 10 years	29	3.50			

Overall	1-3 years	66	3.46	3.50	0.477	Not Significant
	4-6 years	37	3.43			
	7-10 years	14	3.40			
	Less than 1 year	177	3.45			
	More than 10 years	29	3.42			

#### 4. Conclusions

In summary, the differences in long-term self-evaluation among athletes of varying gender, academic background, and years of sports experience are not significant, suggesting that training programs provide equitable growth opportunities for the majority. This also implies that in sports education, all participants have equal access to corresponding resources and excellent coaching. This research will not only deepen the understanding of the long-term development of badminton players but also promote the comprehensive development of athletes in training and competition, enhancing their competitive level.

#### Acknowledgements

This work was supported by 2022 Hunan Traditional Chinese Medicine College Project "Research on the Construction of a new model of Physical Medicine Education for the Elderly under the Background of Healthy China" (No. XY2022.008); 2022 Hunan Provincial Vocational Education Teaching Reform Project "Research on the Construction of Integrated Model of Traditional health Exercise Course" Academic Evaluation Contest "under the Strategy of Healthy China" (No. ZJGB2022004); 2023 Hunan Provincial Education Planning Office Project "Study on Intervention Strategy of Traditional Health Exercise Course" Academic Evaluation Competition "system in Medical colleges"(No. XJK23CTW016).

#### References

- [1] Li Donghua. Research on diversified development paths of badminton in Wuhan Higher vocational colleges [D]. Wuhan Institute of Physical Education, 2023.
- [2] Ge Liang. Research on Training Status and optimization Path of Junior badminton Reserve talents in Jiangsu Province [D]. Nanjing Institute of Physical Education, 2023.
- [3] Wu Jinyan. Research on Long-term Development-oriented Selection and Training Strategies of young badminton players [C]// Chinese Society of Sport Science. Abstract collection of the 13th National Sports Science Conference - Wall newspaper exchange (Sports Training Science Branch) (3). Chengdu Physical Education University; , 2023:2.
- [4] Zhu J, Li L. The development and countermeasures of badminton in China under the background of "big sports" strategy. *Journal of Hubei Sports Science*, 2019, 38(3), 71-75.
- [5] International Olympic Committee. Gender Equality in Sport. Retrieved from <https://olympics.com> (Access on October 2024)
- [6] England Athletics. Gender Equity in High Performance Coaching. 2023. Retrieved from <https://www.EnglandAthletics.org> (Access on October 2024)
- [7] Kohl C J. The Academic and Behavioral Impact of Multiple Sport Participation on High School Athletes[M]. Lindenwood University, 2017.
- [8] Applied Research in Quality of Life. The Influence of Sports Participation, Academic Performances, and Demo-Behavioral Characteristics on University Students' Life Satisfaction. 2023. Retrieved from <https://link.springer.com/article/10.1007/s11482-022-10003-7> (Access on October 2024)
- [9] McLeod T V, Israel M, Christino M A, et al. Sport participation and specialization characteristics among pediatric soccer athletes[J]. *Orthopaedic Journal of Sports Medicine*, 2019, 7(3): 2325967119832399.
- [10] Sport Science Insider. Long-Term Athletic Development (LTAD) Model. 2023. Retrieved from <https://sportscienceinsider.com> (Access on October 2024)
- [11] Badminton Ontario. Long Term Athlete Development. 2023. Retrieved from <https://www.badmintonontario.ca> (Access on October 2024)
- [12] Fullerton S A, Gaudreault K L, Royce I. Implementing Long-Term Athletic Development Within K-12 Physical Education[J]. *Journal of Physical Education, Recreation & Dance*, 2023, 94(6): 6-12.