

Effects of Physical Fitness, Player Ability and Coaching Feedback on the Athletes' Satisfaction and Athletic Performance in China: Moderating Role of Teamwork Competencies

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Abstract

Athletic performance is the foremost requisite for ensuring survival, and achieving growth, in the field of sports. Both, regulators, and scholars are increasingly interested in investigating this issue, as it plays out in diverse settings. Thus, the purpose of the current study is to examine the impact of physical fitness, player ability and coaching feedback on athlete satisfaction and performance in Chinese sports centers. This study further analyzes the moderating impact of teamwork among the nexus of athlete satisfaction and athletic performance. This study collects data from primary sources, such as questionnaires, and subsequently adopts the smart-PLS to analyze the data by using measurement and structural model assessment. The results reveal that physical fitness, player ability and coaching feedback have a significant and positive association with athlete satisfaction and performance. The findings also indicate that athlete satisfaction significantly mediates inter-relationships between physical fitness, player ability, coaching feedback, and athlete performance in China sports centers. This study has provided insightful guidelines to policymakers interested in developing policies and training programs aimed at improvements in levels of athlete satisfaction and performance in sports centers in China.

Keywords: Physical fitness, player ability, coaching feedback, athlete satisfaction, athletic performance, China sports centers

Introduction

As the sports sector in any country gains traction in a dynamic and globalized society and economy, this topic piques the interests of researchers and scholars around the world. Globe-wide, sports are being practiced on institutional, regional, national, and international levels. Across these levels, sports are being recognized as an intrinsically as well as instrumentally valuable practice. From the perspective of socio-economic development, sports are profitable to a country or government. On an individual level, active engagement in sporting activities improves the physical health and well-being of individuals, leading to an increase in productivity and a decrease in stress level (Kim, Oja, Kim, & Chin, 2020). Moreover, in terms of character-building, active participation in sports creates and fosters discipline, determination, and perseverance. Participation in sports also trains individuals to become strategic and efficient leaders and leads to social integration. From the vantage point of disease prevention, it bears to note that regular athletic activities assist in overcoming chronic ailments, develops muscle activity, promotes the formation of strong bones, and improves heart and lung functions in the long

run. Consistent athletic activities help in losing extra body weight, increasing blood circulation, managing diabetes, and controlling stress levels. Sports have now become a dynamic and massive business on both country and global levels, particularly in light of its influence on political, economic, and cultural aspects of a fast-globalizing world. Games, particularly in politics, have the ability to exert strong influences on countries, their identities, and consequently, influence sports players, viewers enthusiasts around the world (Hansen et al., 2021). Physical fitness, players' ability, and perceived coaching feedback are the three significant elements that influence athletic performance and sports development. As noted earlier, physical fitness keeps the athletes healthy by protecting them against diseases. Good health leads them to be active and energetic. Therefore, they are better able to focus on their athletic activities. Players must have several playing abilities. These abilities may be cognitive and/or physical abilities, both of which are instrumental in performing in matches and achieving individual or team targets. These abilities are beneficial to players considering the inherent nature of sports. Similarly, perceived coaching feedback affects the athletic psychology of individual players and thus, affects their decisions and actions (Newman, 2020).

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The current study is being conducted with an aim to examine the impact of physical fitness, player ability and perceived coaching feedback on athlete satisfaction and athlete performance, along with influences of teamwork competencies on the association between athlete satisfaction and athletic performance in the context of the sports sector in China. China is an upper-middle-income developing country. Chinese civilization and culture are one of the most widely recognized in the world. For a long time, the Chinese have been practicing sports in various specific forms. Archery, swordplay, and a specific version of soccer have been played in China for a long time. Chinese athletes practicing martial arts enjoy global appreciation for their unique skills (Lovett, Bloyce, & Smith, 2020). However, surprisingly, the country and its inhabitants have remained, by and large, detached from the rest of the world. However, in an increasingly globalized world, the Chinese are becoming more open to a global process of cultural exchange. Physical fitness has been a long-standing traditional practice in Chinese culture. As it is, fitness clubs and commercial gyms can easily be found across China. Within China, the number of cyclists is remarkably large. As per the statistics from 2012, China is rich in bicycles at 470 million. Basketball has been one of the most revered sports among the young generation in China. Mostly, the NBAs are native Chinese, or even when they are not natives, they have Chinese blood in their veins. Jeremy Lin and Yao Ming are some of the most famous players in China who've taken part in multiple Olympics games, both winter & summer games, since 1932. Jeremy Lin and Yao Ming were hosts in the Summer Olympics in Beijing in 2008. In that Olympics game, fifty-one gold medals which represents one of the highest number of medals ever won (Zhang, Zhou, & Ryall, 2020).

It was in 2008 that Yao Ming and Jeremy Lin won about one hundred medals; this was the greatest number of medals they achieved till that time in any Olympic game since 1932, the time of their first joining the Olympics game. In 2022, in Beijing in China, the Winter Olympics games are scheduled to be held. In China, the most popular sports are football (soccer), badminton, basketball, table tennis, swimming, Wushu, and volleyball. Besides this, the popular regional sports in China are cuju, jianzi, pinball, Quan, Zuo, Wushu, Sanda/sanshou, and beikou tarkbei. The well-known athletes from China are Yao Ming (basketball), Zhang Lian-Wei (Golf), Liu Xiang (hurdles, track & field), Deng Yaping (table tennis), and Li Na (tennis) Liu, Zhang, and Desbordes (2017). China's sports

system has been one of the best sports systems across the world. The popularity and broad scope of the Chinese sports system leads the author to choose this sports system to analyze the influence of physical fitness, player ability and perceived coaching feedback on athlete satisfaction and athlete performance. It bears to note that the Chinese sports sector is making progress consistently, and the Chinese government pays special heed to progress in its games, as they are an important source of private and national revenue Xu, Fan, and Brown (2021). Thus, the current study will be a suitable guideline for sports organizations, sports teams, and sports administration bodies on how to improve athletes' satisfaction and performance with high physical fitness, players' dynamic abilities, perceived coaching feedback, and teamwork competencies.

The athletes' performance and progress in sports are significant to a community as they contribute to body fitness, increased awareness about health, work motivation, determination, self-discipline, all of which are key elements of national building, and ultimately also translate into being sources of national & private earnings. Moreover, sports provide a country with soft power by generating a positive international image of the country at regional and global platforms. The social, national, and international importance of sports requires that athletes' performance should be improved, and sports must be promoted. To this end, researchers and academics are required to pay attention to the factors contributing to athletes' performance and sports progress (Zhou, Chlebosz, Tower, & Morris, 2020). Thus, the aim of our study is to examine the influence of physical fitness, player ability and perceived coaching feedback on athletic performance and to gauge the mediating influences of athlete satisfaction on nexus among physical fitness, player ability, and perceived coaching feedback and athletic performance. Besides this, the aim of our study is also to explore the influences of the teamwork competencies on athletes' satisfaction and athletes' performance and, thus, the linking influences of teamwork competencies on the association between athletes' satisfaction and athletes' performance. In this manner, all the factors mentioned above have been identified and studied as the major contributing factors for the growth and development of the sport industry market in China. Figure 1 shows the size of sports industry market in China from 2013 to 2025, demonstrating the trend for growth of the sports industry in China.

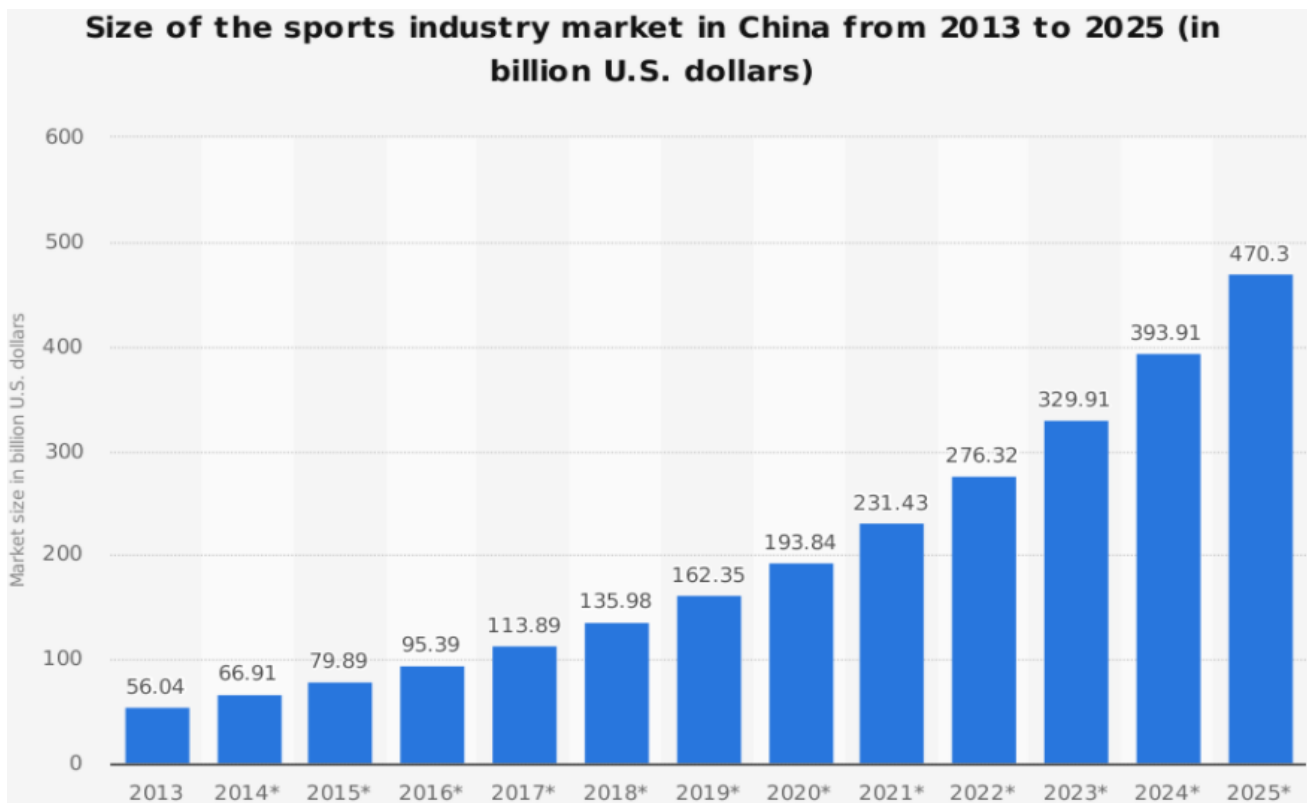


Figure 1: Size of Sports Industry in China

The analysis of the impact of physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance have been prolifically studied in past literature. A significant number of studies have given attention to the contribution of physical fitness, player ability, and perceived coaching feedback in improving athletic performance. However, it merits to note that these studies have addressed the influences of either physical fitness, or player ability, or perceived coaching feedback on athletic performance; most of the studies have explored the influences of physical fitness, player ability, and perceived coaching feedback directly on the progress of the sport without considering the developments affected in the athletes' performance. Only a limited number of studies have addressed the influences of physical fitness, player ability, and perceived coaching feedback on athletic performance. Moreover, the current study further introduces both, a mediator like athletes' satisfaction between athletic of physical fitness, player ability, and perceived coaching feedback and athletic performance, and a moderator like teamwork competencies between athletes' satisfaction and athletes' performance. In the existent literature, authors have introduced either a mediator or only a moderator in sports-related studies. Thus, this current study takes stock of both, athletes' satisfaction as a mediator and teamwork competencies as a moderator, justifying a distinctive position for itself within the existing body of literature on the subject.

In the second part, the paper elaborates on the scholars' views about the influences of physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance and mediating influences of athletes' satisfaction on the association between physical fitness, player ability, and perceived coaching feedback and athletic performance. In this section, the study also sheds light on the moderating influences of teamwork competencies on the nexus among athletes' satisfaction and athletic performance. The third part of the paper describes the research methodology used to collect relevant and supporting data from China' sports canter. This is followed by a description and detailed discussion and interpretation of the study findings as well as a section on the implications of the current study for future researchers.

Literature Review

The sports culture in any country has great significance for the local community, the nation, and the government. Sports play a key role in serving the country, both, at the national, and international levels as it assists in developing a country's image and the image of its people, and in doing so, enhances the country's international reputation. Growth and progress of the sports sector not only enriches the culture of a country but also contributes to the source

of earnings, both for the players and the state. Sports are a remarkable source of earnings for the government in the form of foreign exchange obtained from foreign entities. Athletes' mental and physical performance and, thereby, their progress in sports is affected by multiple significant factors like economic conditions, government cooperation, physical fitness, playing abilities and skills, and coaching behavior (X. Li & Feng, 2021). Our study aims at analyzing the influences of physical fitness, player ability, and perceived coaching feedback on athletes' satisfaction and athletic performance. The analysis of the relationship among physical fitness, player ability, and perceived coaching feedback, teamwork competencies, athletes' satisfaction and athletic performance has a significant place in the existing body of literature. Many studies have focused on the association among these aforementioned factors. Different authors have varying opinions about the nexus among physical fitness, player ability, and perceived coaching feedback, athletes' satisfaction, teamwork competencies, and athletic performance. Our study cites several of them with a view to understanding the nature and extent of relationships among the variables under study i.e., physical fitness, player ability and perceived coaching feedback on athletes' satisfaction and athletic performance.

Physical Fitness and Athletic Performance

The literary works by Solli, Sandbakk, Noordhof, Ihalainen, and Sandbakk (2020), are an investigation into the determinants of sports development, positing that the ability of players to maintain their physical fitness can bring a significant improvement in their athletic performance. Athletes' physical fitness refers to their state of good health and well-being. Physical fitness is the capacity of the human body to undertake certain activities effectively and efficiently. Athletes can maintain their physical fitness through training, exercise, and the management of a proper diet. Almost all schools and sports organizations care for the health of their students or players. For this purpose, they make necessary arrangements for the improvement in their physical fitness. Physical fitness improves the health of the human body by boosting oxygen supply and increasing blood circulation. It strengthens the immune system of the body and prepares it to fight against the attack of serious ailments. It enhances the stamina of the human body to stick to one condition or complete a particular task assigned to them. It is physical fitness that enables athletes to bear suffering and overcome hurdles and fatigue. In this way, physical fitness prepares individual athletes to perform better in the playground (Sánchez-Muñoz et al., 2020). Under physical fitness programs, cardiorespiratory

exercises are included, and athletes learn to properly use oxygen and control the heartbeat. Thus, the heart, lungs, muscles, and bones of the body remain strong, signifying a healthy & strong immune system that can protect the athletes from diseases. Good health enables the players to concentrate their attention and focus on the game target, and they are better prepared against fatigue and sudden shifts or changes in the game situation. Thus, sports functions can be performed better. Physical fitness enhances the power, endurance, and speed of performing certain activities. Moreover, it is physical fitness that enables players to meet challenges and benefit from opportunities. Thus, they are able to show better performance during practice and matches (Henriques Neto, Minderico, Peralta, Marques, & Sardinha, 2020). Based on the above arguments, we hypothesize the following:

H1: There is a significant positive association between physical fitness and athletic performance.

Player Ability and Athletic Performance

The abilities of individual players affect their choices, decision, their activities, quality and effectiveness of their actions, degree of their engagement in athletic activities during training, practice, and matches at different platforms. Thus, the performance of the players in games is determined by the nature of the abilities of the players and the effectiveness with which those abilities are being used or applied. Playing abilities may be cognitive or physical. The nature of abilities to be applied while playing depends on the nature of the sports and its requirements, and assists the athletes in improving their performance Lefebvre, Martin, Côté, and Cowburn (2019). The players may have inborn abilities (both, cognitive and physical) that can be applied while playing, while many playing abilities and skills can be or acquired or developed through training, or these abilities can be progressively improved through practice. However, in any case, the existence of good playing abilities and effective use of these abilities enables the players to learn more about the developmental aspects of sports, the necessary playing tricks, and success or progress opportunities they can potentially benefit from them (Schallmo, Singh, et al., 2018). The players' ability to sense the changes in a situation, the behaviors of opposite team members or coach, and the threats or risks, protects them from dangers and helps them overcome hurdles. Similarly, good decision-making helps them make a good choice at the right time to identify the success opportunities as such, and bring about an improvement in the performance of player in game (Schallmo, Fitzpatrick, et al., 2018).

H2: There is a significant positive association between

player ability and athletic performance.

Perceived Coaching Feedback and Athletic performance

The players' perception of the coach's behavior and conduct affects their thinking, decisions, and actions. The perceived coaching feedback relates to the coach behavior to situation, the task assigned to him, his way of handling crisis situations, his conduct, and his way of interaction with his or her followers. It bears to note that the conduct, behavior, and actions of coaches relate to their knowledge, experience, and abilities. The positive perception on the part of players of the coach's activities, behavior, and conduct during on duty and off duty, and during training or practice, creates a positive attitude in the players about a coach, creates an effective communication network, and fosters better understanding and commitment between players and the coach (Blackett, Evans, & Piggott, 2021; Shimazaki, Taniguchi, & Kikkawa, 2021). When there is a good communication network among the players and the coach, they can exchange their ideas and can find novel solutions to the problems they face individually or as a team. This brings about an improvement in the athletes' performance. The commitment among players and the coach motivates the players to pay more attention to guidance, understand the exigencies of situation, and perform sporting tasks and activities efficiently. Positive perceived coaching feedback helps develop personal characteristics in players like determination, discipline, trust, and self-efficacy. These personal features prepare the players to perform sports activities effectively; therefore, it ultimately leads the players towards the path to success (Fisher, Larsen, Bejar, & Shigeno, 2019).

H3: There is a significant positive association between perceived coaching feedback and athletic performance.

Athletic Satisfaction as a Mediator among Physical Fitness, Player Ability, Perceived Coaching Feedback and Athletic Performance

Physical fitness refers to the good health and well-being of the players and their bodily capacity to perform certain activities efficiently and effectively. In this way, physical fitness fosters a sense of health and body positivity, peacefulness of mind, and self-efficacy to undertake specific activities and meet challenges. In this situation, the players experience satisfaction with their health and work. An enhanced sense of satisfaction leads to an acceleration and improvement in the athletes' performance, as in this case, the athletes are better able to focus on their target and have a better shot to cope with the game standards (Gould, Nalepa, & Mignano, 2020). The players' abilities (both, cognitive abilities like judgment, problem-solving skills and decision-making skills, and physical abilities such as

power, efficiency, and speed, to undertake their athletic activities) and the effective use of these abilities can lead to an improvement in the decisions and actions of players. This positive sense and heightened confidence level in the advantages of playing abilities gives a sense of satisfaction to the players. And this sense of satisfaction improves the players thinking and their performance in the playground (Kim, Do Kim, & Lee, 2020). Perceived coaching feedback affects the thinking, emotions, and feelings of players towards the coach, their fellow players, players from rival teams, and the achievement of the target. The positive perceived coaching feedback enhances the sense of assistance, social support, protection and thus, the sense of contentment. When individual players report a high sense or level of satisfaction under positive perceived coaching feedback, they show more willingness and a greater capacity to perform athletic activities in a satisfactory manner (Fransen, Boen, Vansteenkiste, Mertens, & Vande Broek, 2018). Based on the above arguments, the current study hypothesizes:

H4: Athletic satisfaction is the mediator between physical fitness and athletic performance.

H5: Athletic satisfaction is the mediator between the player ability and athletic performance.

H6: Athletic satisfaction is the mediator between the perceived coaching feedback and athletic performance.

Team Competences as a Moderator between Athletes' Performance and Athletes' Sports Success

Teamwork competencies are the ability to work with others towards a shared goal, participating actively, sharing responsibility and rewards, and contributing to the capability of the whole team. Leaders having these abilities empathize and seek to develop an atmosphere of respect, helpfulness, and cooperation. When all the team members along with their leader have the same intention to a common goal (Giske, Rodahl, Johansen, & Høigaard, 2021; Razali, Radzi, & Husin, 2018), perform actively in the tasks assigned to them, support one another and try to self-actualize of their abilities and skills to meet collective team targets, all the players have a sense of satisfaction. This satisfaction stops them from digressing or diverting their attention away from the goal. They perform athletic activities attentively and more efficiently (Fransen et al., 2018). There are three core competencies of successful teams in sports: the ability to respond to adversities or problems in sports, a profound commitment, and the will to resolve and move through conflict very quickly. According to this study, these three abilities of teams can improve the athletes' level of satisfaction and performance as well. The existence and use of these abilities give a sense

of security, social support, and a chance to make rapid progress in sports. In this situation, players have peacefulness of mind and emotional satisfaction, which ultimately improves their performance on the playground (Montuori et al., 2019).

H7: Team competencies play a mediating role between athletes' performance and athletes' sports success.

Research Methodology

The present study examines the impact of physical fitness, player ability and coaching feedback on athlete satisfaction and performance, and further investigates into the mediating role of athlete satisfaction among the relationships between physical fitness, player ability, coaching feedback, and athletic performance. This study also analyzes the moderating impact of teamwork among the nexus of athlete satisfaction and athletic performance in the context of Chinese sports centers. This study uses primary source of data with questionnaires being used as the main instrument of data collection. These questionnaires are adopted from a number of past studies, for instance, the questionnaire of physical fitness has been adopted from the study of De Moraes, Vilanova-Campelo, Torres-Leal, and Carvalho (2019) that has five items. In addition, player ability and coaching feedback questionnaires are adopted from the study of Allen and Howe (1998) that have two and seven items, respectively. Similarly, the questionnaires related to athlete satisfaction has been adopted from the study of Jowett, Shanmugam,

and Caccoulis (2012) that has eleven items, while the athletic performance questionnaire has been adapted from the study of BaniAsadi and hamid Salehian (2021) and has five items. Finally, the questionnaire related to the team competencies has been adopted from the study of Wallin, Meurling, Hedman, Hedegård, and Felländer Tsai (2007) that has eleven items.

This study has been conducted in the context of the sports centers of Beijing, China. To this end, around 42 top sports centers were selected, and 1100 surveys were shared with these centers through a personal visit. The registered sportsman in these institutions were the respondents that were selected based on simple random sampling. After one month of the distribution, only 757 surveys were received, which shows an approximately 68.82 per cent response rate. The present study has also adopted the smart-PLS to analyze the data by using measurement and structural model assessment. This study has executed the PLS-SEM due to the complexity of the framework and a large sample size (Sarstedt & Cheah, 2019). The present study has executed the convergent and discriminant validity to check the reliability and validity while also executing the path analysis to test the nexus among the variables. The physical fitness (PF), player ability (PA) and perceived coaching feedback (PCFB) have been used as independent variables while athlete satisfaction (AS) has been used as the mediating variable, and team competencies (TC) has been used as the moderating variable, and athletic performance (AP) has been used as the dependent variable. Figure 2 illustrates these variables and their inter-relationships in graphical form.

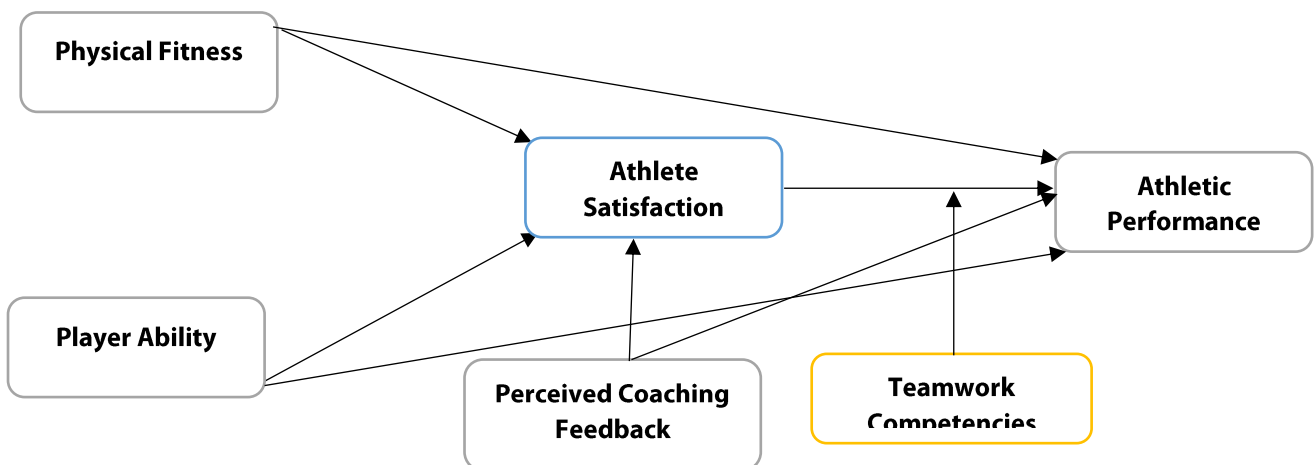


Figure 2: Theoretical Framework

Research Findings

Table 1 shows convergent validity which is an indicator of the relations among items. The results of the convergent

validity show that the Alpha and composite reliability (CR) values are higher than 0.70 while loading values are larger than 0.40 and AVE values are higher than 0.50. These values point to high relations among items.

Table 1

Convergent Validity

Constructs	Items	Loadings	Alpha	CR	AVE
Athletic Performance	AP1	0.776	0.840	0.893	0.676
	AP2	0.817			
	AP4	0.855			
	AP5	0.839			
Athlete Satisfaction	AS10	0.789	0.845	0.884	0.527
	AS11	0.703			
	AS2	0.785			
	AS4	0.813			
	AS5	0.729			
	AS7	0.463			
	AS8	0.740			
Player Ability	PA1	0.924	0.757	0.847	0.736
	PA2	0.786			
Perceived Coaching Feedback	PCFB1	0.654	0.888	0.913	0.601
	PCFB2	0.730			
	PCFB3	0.820			
	PCFB4	0.811			
	PCFB5	0.847			
	PCFB6	0.819			
	PCFB7	0.727			
Physical Fitness	PF1	0.805	0.823	0.879	0.596
	PF2	0.865			
	PF3	0.837			
	PF4	0.583			
	PF5	0.735			
Team Competencies	TC10	0.865	0.754	0.825	0.574
	TC11	0.885			
	TC5	0.888			
	TC6	0.889			
	TC8	0.832			
	TC9	0.799			

Table 2 and Table 3 shown the discriminant validity of the data with the help of Fornell Larcker as well as cross-loadings that show the relations among variables. The results show that the values that

indicated the relations among the construct itself are more than the values that indicate the relations with other constructs. These values point to low relations among the variables.

Table 2

Fornell Larcker

	AP	AS	PA	PCFB	PF	TC
AP	0.822					
AS	0.589	0.726				
PA	0.553	0.492	0.858			
PCFB	0.760	0.642	0.480	0.775		
PF	0.541	0.480	0.391	0.565	0.772	
TC	-0.400	-0.267	-0.281	-0.587	-0.360	0.860

Table 3*Cross-loadings*

	AP	AS	PA	PCFB	PF	TC
AP1	0.776	0.481	0.321	0.598	0.434	-0.339
AP2	0.817	0.459	0.360	0.627	0.435	-0.373
AP4	0.855	0.504	0.528	0.646	0.458	-0.301
AP5	0.839	0.494	0.582	0.629	0.453	-0.312
AS10	0.348	0.789	0.358	0.411	0.315	-0.119
AS11	0.477	0.703	0.395	0.495	0.324	-0.248
AS2	0.519	0.785	0.351	0.590	0.420	-0.206
AS4	0.380	0.813	0.392	0.439	0.357	-0.161
AS5	0.417	0.729	0.386	0.432	0.415	-0.175
AS7	0.308	0.463	0.240	0.278	0.229	-0.094
AS8	0.480	0.740	0.352	0.529	0.336	-0.302
PA1	0.573	0.491	0.924	0.485	0.392	-0.287
PA2	0.334	0.328	0.786	0.310	0.257	-0.177
PCFB1	0.504	0.585	0.358	0.654	0.487	-0.408
PCFB2	0.575	0.436	0.379	0.730	0.538	-0.525
PCFB3	0.603	0.539	0.389	0.820	0.391	-0.380
PCFB4	0.588	0.441	0.318	0.811	0.443	-0.534
PCFB5	0.672	0.532	0.444	0.847	0.399	-0.395
PCFB6	0.676	0.545	0.424	0.819	0.437	-0.391
PCFB7	0.462	0.363	0.251	0.727	0.376	-0.628
PF1	0.392	0.337	0.285	0.392	0.805	-0.240
PF2	0.415	0.383	0.288	0.434	0.865	-0.279
PF3	0.378	0.362	0.301	0.385	0.837	-0.264
PF4	0.454	0.370	0.268	0.503	0.583	-0.278
PF5	0.417	0.374	0.347	0.430	0.735	-0.307
TC10	-0.323	-0.251	-0.273	-0.519	-0.271	0.865
TC11	-0.271	-0.197	-0.212	-0.446	-0.259	0.885
TC5	-0.316	-0.231	-0.253	-0.521	-0.278	0.888
TC6	-0.274	-0.209	-0.226	-0.458	-0.266	0.889
TC8	-0.347	-0.146	-0.217	-0.494	-0.337	0.832
TC9	-0.453	-0.305	-0.251	-0.541	-0.385	0.799

Table 4 shown discriminant validity with the help of the Heterotrait Monotrait (HTMT) ratio, and the results

demonstrate that the values are lower than 0.85. These values also indicate the low relations among the variable's understudies.

Table 4*Heterotrait Monotrait Ratio*

	AP	AS	PA	PCFB	PF	TC
AP						
AS	0.690					
PA	0.697	0.636				
PCFB	0.773	0.720	0.595			
PF	0.646	0.568	0.509	0.658		
TC	0.513	0.334	0.387	0.708	0.503	

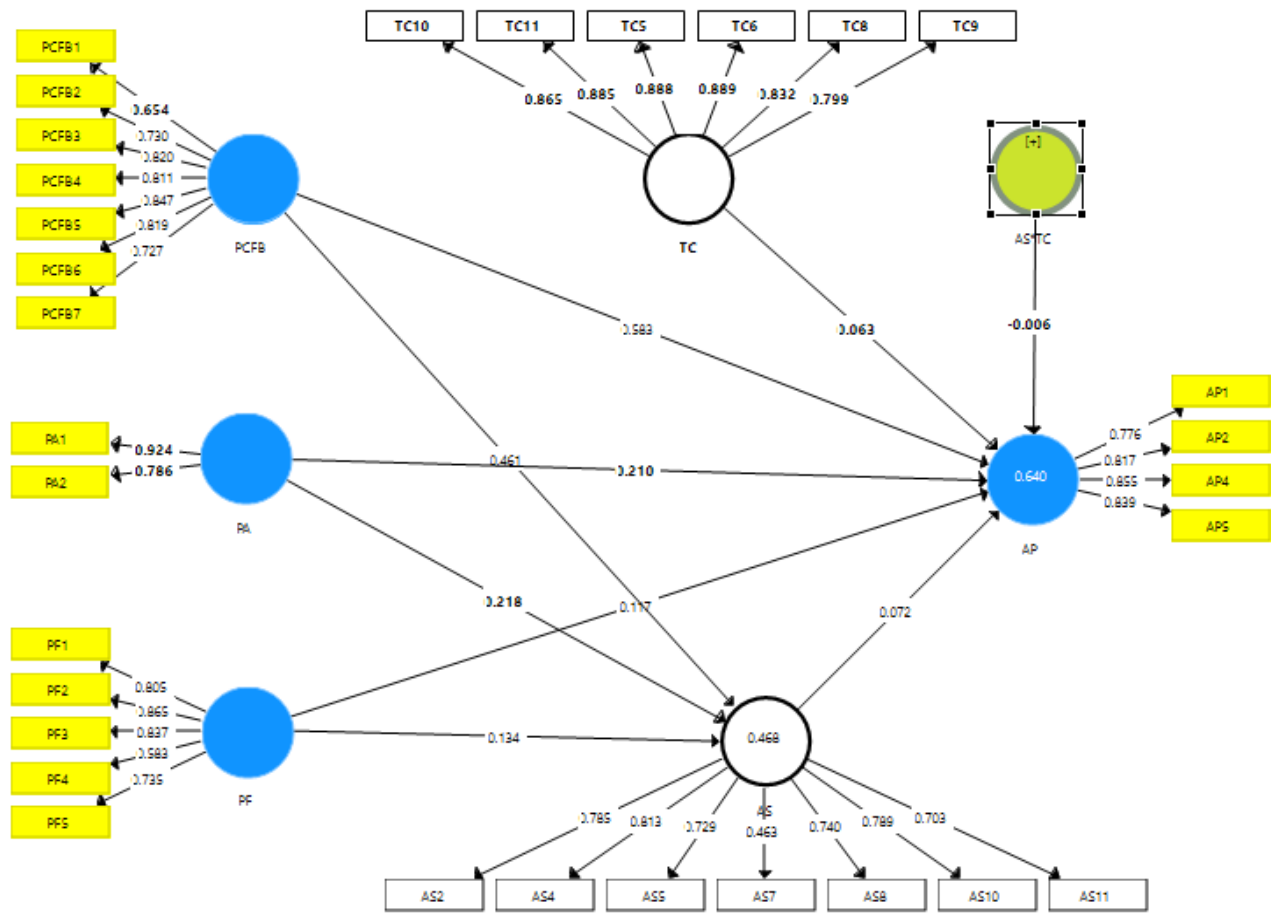


Figure 3: Measurement Model Assessment

The path analysis shows the relations among the variables, and the results reveal that physical fitness, player ability and coaching feedback have a significant and positive

association with athlete performance in Chinese sports centers and therefore, the author accepts H1, H2 and H3. Table 5 illustrates these direct relationships.

Table 5

Direct Path

Relationships	Beta	S.D.	T Statistics	P Values	L.L.	U.L.
AS -> AP	0.072	0.032	2.241	0.027	0.006	0.124
PA -> AP	0.210	0.031	6.672	0.000	0.150	0.271
PA -> AS	0.218	0.040	5.497	0.000	0.141	0.281
PCFB -> AP	0.583	0.040	14.454	0.000	0.511	0.648
PCFB -> AS	0.461	0.035	13.038	0.000	0.396	0.520
PF -> AP	0.117	0.028	4.182	0.000	0.074	0.160
PF -> AS	0.134	0.037	3.597	0.001	0.073	0.207
TC -> AP	0.063	0.024	2.597	0.011	0.019	0.106

The findings also indicate that athlete satisfaction significantly mediates among the relations of physical fitness, player ability, coaching feedback, and athlete performance in the context of sports centers in China and therefore, the study accepts H4, H5 and H6. However, the

results also show that team competencies insignificantly moderate among the nexus of athlete satisfaction and athletic performance, leading the author to reject H7. Table 6 depicts these indirect relationships.

Table 6

Indirect Path

Relationships	Beta	S.D.	T Statistics	P Values	L.L.	U.L.
AS*TC -> AP	-0.006	0.019	0.328	0.743	-0.037	0.036
PF -> AS -> AP	0.010	0.005	1.987	0.050	0.001	0.019
PA -> AS -> AP	0.016	0.008	2.042	0.044	0.002	0.029
PCFB -> AS -> AP	0.033	0.015	2.167	0.033	0.003	0.062

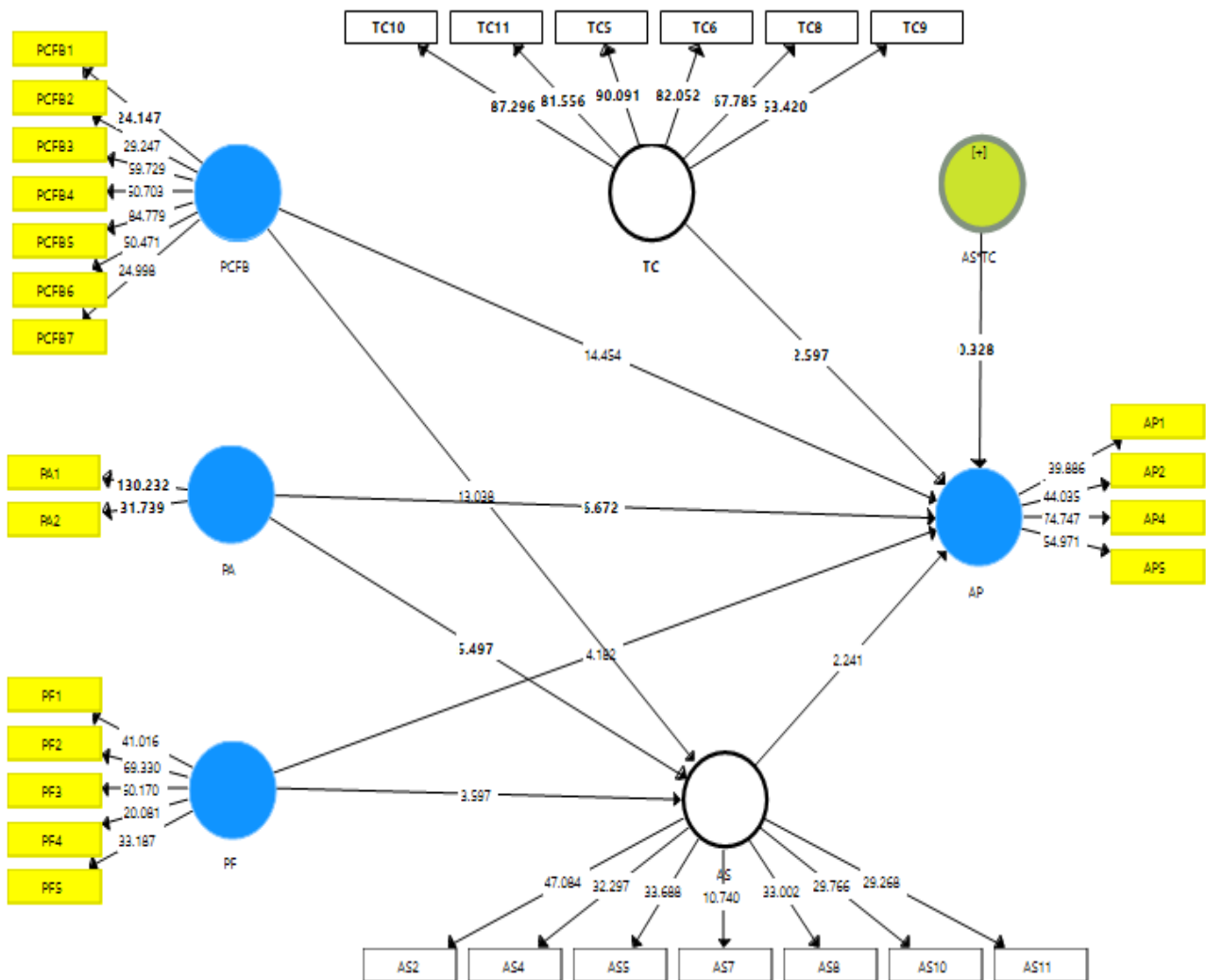


Figure 4: Structural Model Assessment

Discussions

The purpose of the current study is to examine the impact of physical fitness, player ability and coaching feedback on athlete satisfaction and performance in Chinese sports centers. This study also analyzes the moderating impact of teamwork among the nexus of athlete satisfaction and athletic performance. The study results indicate that physical fitness has a positive impact on athletes' performance. These results are in line with the past study of Thiele, Prieske, Chaabene, and Granacher (2020), which

shows that when the physical fitness programs are effectively executed, the athletes have a healthy immune system that protects the players from the attack of serious ailments, and they are both, mentally and physically healthier and stronger. The analysis proves that healthy athletes, because of the physical fitness programs, can more actively participate in the games and successfully achieve a higher level of performance. These results are also in line with the previous study of Pons et al. (2018), which shows that physical fitness makes for a healthy heart and mind, which leads to positive athletic thinking and

emotions, and ultimately leads to higher performance outcomes. The study results also indicate that playing ability has a significant positive impact on athletes' performance. These results are supported by the literary work of Rosimus (2018), which indicates that individual players have innate playing abilities, but some capabilities are developed through effective training and exercises. Nevertheless, all these combined playing abilities (innate and acquired) can improve the athletes' knowledge and actions and thus, boost their performance. These results are also in line with the previous study of Jones et al. (2018), which demonstrates that the players have dynamic capabilities which assist them in learning more about sports during training and further practice as well as performing well while playing the game on the ground. By improving their overall athletic performance, these playing capabilities enable athletes to meet their sports targets or goals.

The results also indicate that perceived coaching feedback has a significant and positive impact on the athletes' performance. These results are supported by the past study of Cook, Fletcher, and Carroll (2020), which states that the perception of the players regarding the thinking, intentions, and behaviors of the coach determines the choice and the activities of the players. If the perceived coaching feedback is positive, the performance of the athletes' stands improved. These results also corroborate the findings of a previous study of Otte, Rothwell, Woods, and Davids (2020), which shows that in sports teams where the coach shows positive thinking, intentions, and performance in favor of the followers, the player under his or her guidance has a positive perception about the performance of the coach. This gives them social support, solace, and assistance in learning the tricks, rules, and principles of the game. This develops understanding and commitment between the players and the coach, which lead to improved performance on the part of the players. The study results reveal that athletes' satisfaction is a significant mediator between physical fitness and athletes' performance. These results are in line with the previous study of Camiré, Rathwell, Turgeon³, and Kendellen (2019), which shows that physical fitness improves the athletes' satisfaction and thus, can bring about an improvement in the performance of players during the match.

These results are also in line with the previous study of Doron, Rouault, Jubeau, and Bernier (2020), which posits that athletes' satisfaction is enhanced in case the players have high physical fitness, and this increased satisfaction in players leads to improved performance. It is also revealed by the study results that athletes' satisfaction is a

significant mediator between the players' abilities and athletes' performance. These results are supported by the past study of Cremin and Anderson (2019), which demonstrates that the effective use of playing capabilities improves the athletes' satisfaction and thus, can bring an improvement in the performance of players while playing. The study results have also shown that athletes' satisfaction is a significant mediator between the perceived coaching feedback and athletes' performance. These results are approved by the literary work of C. Li, Martindale, and Sun (2019), which implies that the athletes' mental and emotional satisfaction is improved by the positive perceived coaching feedback, and that improved satisfaction leads to better quality performance.

Theoretical and Empirical Implications

The current study is theoretically important on account of its remarkable contribution to the literature on sports development. This study throws ample light on three significant factors i.e. physical fitness, player ability, and perceived coaching feedback, and the study describes in detail the influences of physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance. Numerous researchers and academics have explored the role and contribution of physical fitness, player ability, and perceived coaching feedback in affecting improvement in athletic performance. However, influences of physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance have not been explored at length to the extent done in the present study. Most past studies have studied physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance separately. Only a limited number of studies have addressed the contribution of physical fitness, player ability, and perceived coaching feedback in improving athletic performance within one theoretical and empirical framework. It bears to note that this study removes this literary gap by exploring the relationship between physical fitness, player ability, and perceived coaching feedback and the improvement in athletic performance. Moreover, it also introduces and studies the mediating influences of athletes' satisfaction between physical fitness, player ability, and perceived coaching feedback and athletic performance, and moderating influences of teamwork competencies on the association among athletes' satisfaction and athletic performance. By presenting both teamwork competencies as a moderator and athletes' satisfaction as a mediator in the same study, this research makes a pioneer contribution to the existing body of literature on the subject.

The current study also carries empirical implications in addition to having made important theoretical contributions. This study has a particularly remarkable empirical importance in fast-developing states like China as it provides a guideline on how to manage different aspects related to sports and how players' performance can be improved. It has been demonstrated by the study that athletic performance can be improved by enhancing the physical fitness of the players as this improves the health of players and enables them to actively participate in the games. The use of playing abilities (both, cognitive and physical abilities) improves the choices and actions of players during training and actual matches. The players' perception of the coach's behavior and his intentions affects their thinking and, ultimately, their choices and actions. This study also provides the guidelines to policymakers in the process of developing the policies related to the improvement in athlete satisfaction and performance in the sports centers in China. Thus, positive perceived coaching feedback leads to improvement in the players' performance. In addition, the study shows that high level of physical fitness, improved player ability, and positive perceived coaching feedback enhances the satisfaction level among players, which further improves athletic performance. Moreover, the study suggests that if the perceived coaching feedback is not positive and favorable, the athletes' satisfaction does not bring any significant level of improvement in the athletic performance of the players.

Conclusion and Limitations

The reason behind the conduct of the study is to examine the contribution of physical fitness, player ability, and perceived coaching feedback in bringing about an improvement in athletic performance and determining the extent to which athletes' satisfaction/performance is affected by factors such as physical fitness, player ability, and perceived coaching feedback. The study is also designed to examine the role of perceived coaching feedback in linking the athletes' satisfaction and athletic performance. To meet these objectives, a practical analysis is made in the context of the Chinese sports sector. The study analyzes the degree of the influence of physical fitness, player ability, and perceived coaching feedback on rate of the improvement in athletic performance. The study examines how strongly the athletes' satisfaction creates a link between the physical fitness, player ability, and perceived coaching feedback and athletic performance, and how perceived coaching feedback builds a link between the athletes' satisfaction and athletes'

performance. The resulting findings elaborate on how improved physical fitness accelerates the athletes' positive performance during practice and actual games. The existence of core playing capabilities and their effective use improves athletes' performance and sports development. Similarly, the positive perception of coaching feedback positively affects the players thinking and performance in the playground. The study also demonstrates the linking role of athletes' satisfaction between physical fitness, player ability, and perceived coaching feedback and the improvement in athletic performance, and insignificant linking role of teamwork competencies between athletes' satisfaction and athletes' performance.

The present study is susceptible to certain limitations, which creates an opportunity for future researchers to address these limitations in their research work. First, the study results and their conceptions are based on the analysis of physical fitness, player ability, perceived coaching feedback, athletes' satisfaction, teamwork competencies and athletic performance in the context of the Chinese' sports sector. China is an upper-middle-income country rich in a culture of sports and physical fitness. Moreover, China's political, social, and economic conditions may be different from other developed or even developing countries. Therefore, the results of this study may not be equally valid in other sports settings. Thus, the authors must also analyze physical fitness, player ability, perceived coaching feedback, athletes' satisfaction, athletic performance, teamwork capabilities in more than one country for a more accurate and valid analysis of the relationships between the variables under study. Moreover, the study particularly analyzed the influence of only three sports-related factors i.e., physical fitness, player ability, and perceived coaching feedback on the improvement in athletic performance. Additional economical or sports-related factors also have a potentially significant impact on athletes' performance; however, these have not been explored at present. For these highlighted reasons, the findings of the present study have limited value; thus, to broaden the scope, soundness and level of generalizability and universality of the study, future researchers must also pay attention to these additional factors that may or may not affect an individual athlete's performance.

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