**International Journal of Sport Culture and Science**
December 2020 : 8(4)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS.2020.611

# An Investigation of the Relationship between Female Volleyball Players' Intelligence Types and Their Sportive Success

**Seyfi SAVAŞ[1], Yeliz AY YILDIZ[2], Yaşar İsmail GÜLÜNAY[3]**
[1]Gazi University, Ankara, TURKEY
https://orcid.org/0000-0002-0780-7697
[2]Gazi University, Ankara, TURKEY
https://orcid.org/0000-0002-2002-0389
[3]Gazi University, Ankara, TURKEY
https://orcid.org/0000-0002-0590-2164
**Email:** seyfi@gazi.edu.tr , yelizayyildiz1977@gmail.com , ismailgulunay@karabuk.edu.tr

***Type: Research Article (Received: 18.09.2020 - Accepted: 20.11.2020)***

## Abstract

The main purpose of this study was to determine the intelligence types (verbal, mathematical, visual, musical, interpersonal, naturalist, kinesthetic and intrapersonal) of female volleyball players with their sub-dimensions and enlighten the relation between the types of intelligence and their sportive success. 104 female volleyball players, who actively play in Turkish volleyball leagues, participated in this study. "Personal Information Form" developed by researchers and "Multiple Intelligence Observation Form" by Selçuk, Kayılı, Okut (2003) were used as data collection tools. SPSS statistical software (25.0) was used for data analysis. Descriptive statistics and Pearson correlation analysis were applied to the data set. When the participants' types of intelligence were examined, it was seen that the players who possess naturalist, visual and interpersonal intelligence predominated in numbers. It was found that there were significant correlations between the sportive success and visual intelligence type, and the sportive success and verbal intelligence. The results clearly reveal that the type of intelligence was not the sole factor affecting the sportive success. The data obtained in this study is expected to blaze the way for the future studies in this field.

**Keywords:** Multiple Intelligence, Volleyball Players, Sportive Success

## Introduction

It is crucial to choose the appropriate sports branch before starting one's sports life. In this context, while choosing sports branches, in addition to family members, friend environment and role models, they tend towards sports in the area where they can feel more relaxed and feel the sense of sportive success at the peak (Coakley, 2017, s.54). The general aim in sports branches, in order to achieve the targeted sportive success, is the improvement of the athletes 'performance by accommodating the physical features, psychological factors and motor adaptation demanded by the sport branch. Today the scientists, trainers and players exert concerted efforts to improve the performance of their teams to a maximum level (Koçak, 2012).

Volleyball, which has a history of nearly 100 years, is also a team game that needs various sports skills. It helps individuals develop physically, emotionally, mentally, and socially (Bayraktar & Sunay, 2007).

While all kinds of factors that may affect sportive success are examined comprehensively, the view that athletes' physical characteristics as well as mental characteristics are effective in their achievements, is gaining more importance day by day (Brewer, 2009). For example, a volleyball player is obliged to observe both the ball, his/her teammates, and the opponent at the same time during the match, but also to do the action that can create both the best attack and the best defense (Fleddermann, Heppe, Zentgraf, 2019). Considering all these observations and the short time that the player has, it is seen that all of them are separate from each other but at the same time in connection, and when implementing all these, a great mental activity is needed in addition to physical capacities (Raab, 2014).

Intelligence have been defined by so many scientists from different disciplines (Demirel et.al, 2006). However, the Multiple Intelligence Theory, proposed by Howard Gardner, have brought a new dimension to this area. According to Gardner, intelligence can be defined as the capacity of the creating a product which is valuable in more than one culture, the skill to bring efficient and effective solutions to the problems one encounters in daily life, and the ability to recognize new and complex structured problems that need to be resolved (Saban, 2005).

In multiple intelligence theory, which advocates that intelligence differentiates with the effect of biological and cultural structures, it is known that there are 8 different intelligence areas including Verbal-Linguistic, Logical-Mathematical, Visual-Spatial, Musical-Rhythmic, Physical-Kinesthetic, Interpersonal-Social, Intrapersonal and Naturalist Intelligences (Gardner, 2012). Determining the profiles of individuals in intelligence fields is an important educational aspect (Hassan et.al,2011). Besides, when talking about the mental skills that individuals have, it is stated that it would be better to say it as different fields that are independent from each other but also in relation, rather than a "general intelligence" (Moran, Kornhaber ve Gardner, 2009).

When the literature is analyzed, many studies in the field of multiple intelligence have been found within the scope of sports activities (Altınmakas, 2011; Tekin, 2009; Yıldız, 2019; Sevinç, 2016; Vaughan, 2015; Collins, 2005). However, studies on the potential of intelligence fields to affect sportive performance have been observed to be limited.

The aim of the research was to determine the intelligence types of female volleyball players with their sub-dimensions (Verbal-Linguistic, Logical-Mathematics, Visual-Spatial, Musical-Rhythmic, Physical-Kinesthetic, Interpersonal, Intrapersonal and Naturalist) and to reveal the relationship between it and sportive success.

## Method

### Research Model

The study was carried out using survey design, one of the quantitative models. Studies in which the opinions or characteristics of many participants are tried to be determined are survey studies (Büyüköztürk et.al,2018).

### Participants

104 female athletes actively playing in Turkish professional volleyball leagues (Sultans League and Women 1st League) formed the research group. Participants had been informed within the scope of the research before the data was collected. Gazi University ethics commission (No: 2020–506) was informed about the publication and the data was collected from only volunteer volleyball players.

### Data Collection Tools

"Personal Information Form" developed by the researchers in the scope of similar studies and "Multiple Intelligence Observation Form" from the book "Multiple Intelligence Applications" (2003) by Selçuk, Kayılı, Okut were used as data collection tools. And the number of matches for the national team was used as the indicator of sportive success.

Multiple Intelligence Observation Form consists of 80 questions in total and 10 questions for each intelligence area. The research group marked the questions between 0-4 according to themselves. The maximum score that can be achieved for an intelligence area is 40.

Cronbach Alpha reliability coefficient for the Multiple Intelligence Observation Form is .86. The values of this coefficient for the sub- dimensions are .62 for verbal intelligence, .70 for mathematical intelligence, .71 for visual intelligence, .68 for musical intelligence, .69 for kinesthetic intelligence, .86 for naturalist intelligence, .63 for interpersonal intelligence and .66 for intrapersonal intelligence.

### Analysis of the Data

The data was evaluated using SPSS 25.0. The demographic information about the participants was defined and Pearson Correlation Coefficient test was used.

## Findings

**Table 1.** Demographic Information about the Participants

| | | Min. | Max. | $\bar{x}$ | SD | f | % |
|---|---|---|---|---|---|---|---|
| **Age** | | 19 | 32 | 24.42 | 4.26 | | |
| **Sport Age** | | 6 | 16 | 12.52 | 1.67 | | |
| **Position** | Libero | | | | | 14 | 13.50 |
| | Setter | | | | | 19 | 18.30 |
| | Hitter | | | | | 32 | 30.80 |
| | Middle blocker | | | | | 29 | 27.90 |
| | Opposite | | | | | 10 | 9.60 |
| **Number of Matches for the National Team** | 0 | | | | | 50 | 48.00 |
| | 1-10 | | | | | 16 | 15.5 |
| | 11-20 | | | | | 11 | 10.5 |
| | 21-30 | | | | | 8 | 7.7 |
| | 31-40 | | | | | 10 | 9.6 |
| | 41+ | | | | | 9 | 8.7 |

Demographic information of the participants in the research was given in Table 1. Accordingly, the minimum age of athletes was 19 while the maximum age was 32. Sports age varied between 6 and 16. According to their positions, there were 14 libero, 19 setter, 32 hitter, 29 middle blocker and 10 opposites. When looking at the number of matches for the national team, 50 athletes had zero, 16 athletes had matches between 1-10, 11 athletes had matches between 11-20, 8 athletes had matches between 21-30, 10 athletes had matches between 31-40 and 9 athletes had matches more than 40.

**Table 2.** *T*he Distribution of the Multiple Intelligence Types of Participants

| Linguistic | Mathematical | Visual | Musical | Kinesthetic | Interpersonal | Intrapersonal | Naturalist | Total |
|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 20 | 9 | 10 | 19 | 13 | 29 | 104 |

Table 2 was based on the distribution of the multiple intelligence types of participants. 2 players had verbal, 2 players had mathematical, 20 players had visual, 9 players had musical, 10 players had kinesthetic, 19 players had interpersonal, 13 players had intrapersonal and 29 players had naturalist intelligence.

**Table 3.** Intelligence Type Scores of the Participants According to the Number of Matches for the National Team

| **Number of matches for the national team** | **0** | | **1-10** | | **11-20** | | **21-30** | | **31-40** | | **41+** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\overline{x}$ | **SD** | $\overline{x}$ | **SD** | $\overline{x}$ | **SD** | $\overline{x}$ | **SD** | $\overline{x}$ | **SD** | $\overline{x}$ | **SD** |
| **Linguistic** | 26.14 | 4.90 | 27.20 | 5.26 | 23.50 | 7.32 | 19.67 | 2.51 | 22.25 | 5.50 | 21.67 | 4.37 |
| **Mathematical** | 27.42 | 6.26 | 33.20 | 4.07 | 30.25 | 1.70 | 25.67 | 3.32 | 25.50 | 5.19 | 32.67 | 4.59 |
| **Visual** | 29.18 | 5.11 | 28.10 | 6.82 | 31.25 | 6.65 | 32.00 | 6.00 | 33.25 | 7.50 | 35.33 | 3.98 |
| **Musical** | 29.06 | 6.91 | 31.20 | 6.94 | 28.25 | 9.06 | 26.00 | 4.16 | 26.00 | 7.57 | 26.83 | 5.56 |
| **Kinesthetic** | 30.12 | 5.27 | 32.70 | 4.11 | 30.75 | 6.65 | 28.67 | 6.11 | 29.75 | 2.98 | 33.50 | 3.33 |
| **Naturalist** | 31.83 | 5.73 | 34.40 | 6.55 | 29.00 | 7.16 | 30.67 | 6.11 | 29.00 | 10.52 | 30.83 | 3.86 |
| **Interpersonal** | 30.97 | 4.61 | 31.80 | 6.37 | 32.25 | 3.09 | 33.00 | 6.15 | 27.50 | 4.43 | 31.50 | 2.81 |
| **Intrapersonal** | 30.40 | 4.49 | 31.50 | 3.77 | 32.25 | 3.77 | 32.00 | 7.71 | 32.00 | 6.78 | 32.33 | 4.84 |

In table 3, the average intelligence scores of the athletes were grouped according to the number of matches they had played for national team, which was an indicator of sportive success.

**Table 4.** Intelligence Type Scores of the Participants According to Their Positions

| Position | Libero | | Passer | | Smacker | | Mid player | | Opposite | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | SD | $\bar{x}$ | SD | $\bar{x}$ | SD | $\bar{x}$ | SD | $\bar{x}$ | SD |
| **Linguistic** | 23.57 | 4.90 | 26.79 | 4.80 | 25.57 | 5.72 | 25.69 | 5.59 | 26.00 | 3.74 |
| **Mathematical** | 24.57 | 6.26 | 29.21 | 5.59 | 29.10 | 6.41 | 28.45 | 6.07 | 28.60 | 4.72 |
| **Visual** | 32.14 | 5.11 | 30.68 | 5.48 | 31.50 | 5.26 | 30.97 | 5.47 | 33.20 | 6.45 |
| **Musical** | 28.79 | 6.91 | 28.89 | 6.12 | 28.67 | 6.91 | 29.79 | 6.96 | 25.80 | 7.19 |
| **Kinesthetic** | 31.50 | 5.27 | 30.00 | 5.15 | 29.77 | 5.38 | 31.14 | 4.91 | 33.60 | 3.97 |
| **Naturalist** | 31.93 | 5.73 | 31.16 | 6.62 | 32.17 | 4.88 | 32.76 | 6.36 | 34.20 | 6.81 |
| **Interpersonal** | 31.36 | 4.61 | 32.16 | 4.71 | 30.77 | 4.35 | 30.79 | 4.90 | 35.20 | 3.63 |
| **Intrapersonal** | 29.86 | 4.49 | 29.89 | 4.74 | 30.90 | 4.35 | 31.34 | 4.18 | 34.00 | 4.63 |

In Table 4, the average intelligence scores of the athletes were grouped according to their positions.

**Table 5.** The Relation between Types of Intelligence and the Number of Matches for the National Team

| | Linguistic | Mathematical | Visual | Musical | Kinesthetic | Interpersonal | Intrapersonal | Naturalist |
|---|---|---|---|---|---|---|---|---|
| **Number of matches for the national team** | **-.242*** | .141 | **.447**** | -.111 | .110 | .061 | .181 | .057 |

In table 5, when the correlation test was conducted in order to find a relationship between the number of matches for the national team, which was an indicator of sportive achievement, and intelligence areas, there were found a relationship between the number of matches for the national team and verbal intelligence and a relationship between the number of matches for the national team and visual intelligence.

## Discussion and Conclusion

The research was conducted to determine the intelligence types of female volleyball players and to reveal the relationship between the intelligence types of these athletes and the sportive success.

As it can be seen in table 2, when the intelligence areas of the athletes participating in the study are examined, the number of athletes with naturalist intelligence type is 29, the number of athletes with visual intelligence type is 20, and the number of athletes with interpersonal intelligence type is 19. It is observed that athletes with naturalist, visual and interpersonal intelligence types are more than the athletes with other intelligence types. In this context, it

can be thought that athletes with naturalist, visual and interpersonal intelligence types may have turned towards volleyball.

The sportive success of the athletes has been determined according to the number of matches for the national team. According to table 3, when the intelligence areas of the athletes, who have played for the national team more, are examined, the presence of athletes, whose intelligence areas are physical, mathematical, and naturalist, are determined too. The result is an indication that the only factor affecting sportive success is not the type of intelligence. As seen in table 3 again, when the intelligence type average scores of the athletes, who have the highest number of matches for the national team, is examined, it is determined that the visual intelligence score has the highest value. However, as stated in table 5, according to the correlation test results, there is a positive moderate relationship between visual intelligence and the number of matches for the national team (r=.447). According to the result, it can be mentioned that athletes with high visual intelligence score may have high sportive success. Within the scope of table 3, it is seen that the athletes with the highest number of matches for the national team have the lowest intelligence score in the verbal area. In addition, according to table 5, there is a negative low relationship (r = -. 242) between verbal intelligence and the number of matches for the national team, and no significant relationships has been found between the other intelligence areas and it. According to Cohen (1988), between .10 and .29 refers to a positive low; .30 to .49 refers to a positive moderate; between .50 and 1.00 refers to a positive high; -.10 to -.29 refers to a negative low; -.30 to -.49 refers to a negative moderate; between -.50 and -1.00 refers to a negative high-level relationship. Kurt and Savaş (2019) found that there was a positive moderate relationship between physical intelligence and sportive success in their study, where they analyzed the relationship between the intelligence types and sportive success of fencing athletes competing in the World Cups of Foil Fencing. Aytaç (2017), in his research with taekwondo athletes, concluded that multiple intelligence had positive effects on sportive performance. Sivrikaya and Kaya (2009) concluded in their studies with sixth grade students that performing volleyball education in the framework of multiple intelligence theory was more effective than traditional method. Ulukan (2018), in his study examining the relationship between intelligence types and attention and performance levels in archers aged 14-20, concluded that there was a significant relationship between intelligence types and attention and performance levels. When the relationship between archers' intelligence types and their performances was examined, it was observed that there was a low positive correlation with physical intelligence, while there was a negative low relationship with naturalist intelligence. Vaughan (2015), in his research on intelligence's role in sports, discussed the approaches about intelligence and reached the conclusion that intelligence was an important difference for sportive success as a result of his studies on 330 athletes. Yıldız (2019), in his research on athletes doing individual and team sports, found that there was a relationship between the multiple intelligence levels of the athletes and the motivation levels specific to the sport. Sevinç and Şıktar (2016), in their studies with football, badminton, swimming and taekwondo athletes, reached the conclusion that interpersonal intelligence was the highest for badminton and football; logical intelligence was the highest for swimming and taekwondo; for these branches the lowest intelligence was musical. Çinkılıç and Soyer (2013) concluded that physical intelligence was high and visual intelligence was low in their studies with students of physical education. In their studies with the students of Physical Education Department, Kahraman and Bavlı (2014) stated that interpersonal and physical intelligence were the dominant intelligence and musical and naturalist were the weak intelligence areas. It may be thought that the similarities and differences between the studies are due to sample groups or sports branch types.

According to table 4, when the positions of the athletes participating in the research and multiple intelligence scores were examined, the verbal, mathematical and intrapersonal intelligence scores of the athletes playing in libero position have been found to be quite low. When libero players are evaluated according to the number of matches for the national team, the players with high naturalist intelligence score come to the fore. It is noteworthy that the players who play in setter position have high visual intelligence scores. Altınmakas (2011), in his study on elite basketball players, evaluated multiple intelligence areas according to the players' positions, but could not achieve any significant differences. Collins (2005) investigated whether intelligence was a talent and argued that intelligence was an important individual difference that could be developed with correct teaching methods.

Although the results obtained from the literature overlap with the study, it is an indicator that intelligence is an important factor affecting sports success. It is thought that the data obtained will help individuals in the direction of the volleyball branch and shed light on the studies that will examine the relationship between intelligence types and sportive success.

## REFERENCES

Altınmakas, O. (2011). Elit basketbol oyuncularının oynadıkları mevkilere göre çoklu zekâ dağılımlarının incelenmesi. Yüksek Lisans Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Aytaç, K. Y. (2017). Comparison of multiple intelligence and exercise performance of male and female university students in taekwondo of Turkey. European Journal of Physical Education and Sport Science. DOI:10.5281/zenodo.837843.

Bayraktar, B. & Sunay, H. (2007). Türkiye'de elit bayan ve erkek voleybolcuların spora başlamasına etki eden unsurlar ve spordan beklentileri. Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi, 5(2), 63-72.

Brewer BW. (2009). Introduction. In: Sport Psychology. Ed: Brewer BW, Wiley Blackwell, Chichester, UK.

Büyüköztürk, Ş., Çakmak, K. E., Akgün Ö. E., Karadeniz, Ş. & Demirel, F. (2018). Bilimsel araştırma yöntemleri. Ankara:Pegem.

Coakley, J. (2017). Sports in society: Issues and controversies. McGraw-Hill Higher Education.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.) Hillsdale, NJ: Lawrence Erlbaum Associates.

Collins, T. (2005). Is intelligence a skill? Journal of Sport Science, 4, 1265-1266.

Çinkılıç, İ., Soyer, F. (2013). Beden eğitim öğretmen adaylarının çoklu zekâ alanları ile problem çözme becerileri arasındaki ilişkinin incelenmesi. Spor Yönetimi ve Bilgi Teknolojileri, 8(1).

Demirel, Ö., Başbay, A., & Erdem, E. (2006). Eğitimde çoklu zekâ kuram ve uygulama. Ankara: Pegem.

Fleddermann, M. T., Heppe, H., & Zentgraf, K. (2019). Off-court generic perceptual-cognitive training in elite volleyball athletes: Task-specific effects and levels of transfer. Frontiers in psychology, 10. DOI:10.3389/fpsyg.2019.01599.

Gardner, H. (2012). Zihin Çerçeveleri. (Çev. E. Kılıç, G. Tunçgenç). İstanbul: ALFA

Hassan, A., Sulaiman, T., & Baki, R. (2011). Philosophical approach in applying multiple intelligence in teaching and learning as viewed by Malaysian schoolteachers. International Journal of Business and Social Science, 2(16), 205-210.

Kahraman D.İ., Bavlı, Ö. (2014). Investigation the multiple intelligence areas of university students who study in different departments. International Journal of New Trends in Arts, Sports & Science Education (IJTASE), 3(3).

Koçak, Ç. V. (2012). 2012 Londra olimpiyat oyunları bayanlar voleybol Avrupa kıta final etabı müsabakalarında bazı fiziksel ve teknik değişkenlerin başarı ile ilişkisi. Yüksek Lisans Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Ankara.

Kurt, K. A. & Savaş, S. (2019). Uluslararası gençler eskrim turnuvalarına katılan erkek sporcuların zekâ tipleri ile sportif performansları arasındaki ilişkinin incelenmesi. 17.Uluslararası Spor Bilimleri Kongresi, 304.

Moran, S., Kornhaber, M., & Gardner, H. (2009). Orchestrating multiple intelligences. Kaleidoscope: Contemporary and classic readings in education, 188-192.

Raab, M. (2015). SMART-ER: a situation model of anticipated response consequences in tactical decisions in skill acquisition—extended and revised. Frontiers in psychology, 5, 1533, DOI:10.3389/fpsyg.2014.01533.

Saban, A. (2005). Çoklu zekâ teorisi ve eğitim. Nobel Yayın Evi, Ankara: Nobel Yayın Evi

Selçuk, Z., Kayılı, H., & Okut, L. (2003). Çoklu Zekâ uygulamaları. Ankara: Nobel.

Sevinç, D. (2016). Farklı spor branşlarındaki sporcuların fizyolojik ve fiziksel parametrelerinin çoklu zekâ ile ilişkilendirilmesi. Yüksek Lisans Tezi, Atatürk Üniversitesi Sağlık Bilimleri Enstitüsü, Erzurum.

Sevinç, D., & Şıktar, E. (2016). The Association of Physiological and Physical Parameters of Athletes in Different Sports with Multiple Intelligences, International Journal of Science Culture and Sport, 4(4), 431-442, DOI:10.14486/IntJSCS597.

Sivrikaya, A.H., Kaya, M. (2009). Çoklu zekâ kuramına dayalı öğretim yönteminin 6. Sınıf öğrencilerinde beden eğitimi dersi başarısına etkisi/the effect of teaching method based on multiple intelligence theory on the success of physical education lesson of 6th class students. Journal of Physical Education and Sport Sciences, 11(2).

Tekin, M. (2009). Ferdi ve takım sporlarında erkek ve kız sporcuların farklı zekâ tiplerindeki seviyelerinin karşılaştırılması. Beden Eğitimi ve Spor Bilimleri Dergisi, Cilt 11, Sayı 4, 2009

Ulukan, M. (2018). Okçuların dikkat ve performans düzeylerinin zekâ türleri ile ilişkisinin incelenmesi. Yüksek Lisans Tezi, Aydın Adnan Menderes Üniversitesi Sağlık Bilimleri Enstitüsü, Aydın.

Vaughan, R. (2015). The role of intelligence in sports. PhD Thesis, Faculty of Life and Health Sciences of Ulster University, Ireland.

Yaşar, M. (2010). Duygusal zekâ ve sporcu performansı ilişkisi: Kayseri'de bir araştırma. Yüksek Lisans Tezi, Erciyes Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.

Yıldız, Y. (2019). Bireysel ve takım sporcularının sportif karakterlerinin ve zekâ boyutlarının sportif başarı motivasyonları üzerine etkisinin incelenmesi. Doktora Tezi, Muğla Sıtkı koşman Üniversitesi Sağlık Bilimleri Enstitüsü, Muğla.