

A Study of Specific Coordinative Abilities between Athletes and Non-Athletes

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Abstract:

Background: The purpose of this study was to examine the ability of male athletes with non-athletes in terms of orientation and differentiation ability.

Materials and Methods: A total of forty (40) participants were used in the study (20 athletes and 20 non-athletes). All of the athletes competed at the district level from Paikar Sports Association in Murarai, West Bengal, India. Non-athletes selected as subjects from Kabi Nazrul College, Murarai, West Bengal, India. samples were aged between 20 to 25 years who volunteered to participate in this study. After reviewing critical and related literature on the subject, the present researcher opted for the variables orientation ability and differentiation ability as variables. The numbered medicine ball run test was used to assess orientation ability, with scores recorded in seconds, and the backward medicine ball throw test was used to assess differentiation ability, with points recorded. SPSS version 20.0 for Windows was used to analyze the data. To investigate if there was a difference in orientation and differentiation ability between male athletes and non-athletes, an independent t-test was performed. The level of significance was set at 0.05.

Results: The results demonstrated that there was a substantial difference in differentiation ability and no significant difference in orientation ability between male athletes and non-athletes.

Conclusion: Between male athletes and non-athletes, the state of being orientated position or positioning concerning points or other specified directions-orientation ability is ambiguous in the present study.

Keywords: Coordinative ability, Differentiation ability, Orientation ability, Athletes and non-athletes.

Date of Submission: 01-02-2022

Date of Acceptance: 13-02-2022

I. Introduction

In the opinion of motor activity theory, coordination generally refers to a complex of primarily psychomotor qualities including the ability to quickly learn new movements, the ability to make rapid and effective adjustments with different conditions, specific to different types of activity, by restructuring existing activities movements¹. Likewise, with the participation of higher nerve segments, coordination abilities are displayed. This feature is particularly significant in the execution of all voluntary motor activities, which are characterized by higher quality indices². According to³ optimal success in many sports necessitates a combination of factors, such as effective motor coordination and behavioural coordination, and perceptual abilities. In addition to improving athletic performance, coordination ability plays a key role in demonstrating tactical skills in situations that are continuously changing in team sports⁴. Long-term training courses are important coordination skills for learning games and sports skills and continuous improvement and correction⁵. In terms of athletic performance, coordination abilities have taken on a significant role in competition and performance⁶. Athletes comply with running on the field and suddenly change direction during a competition⁷. This type of abrupt activity necessitates a high level of coordination, such as differentiation and orientation. So the current study would enlighten the specific coordinative abilities between athletes and non-athletes.

According to previous reports, the level of development of various coordinative abilities is critical in the application of various movement techniques, the production of some motoric performance aspects, and the presentation of technical and tactical skills in various scenarios during a sporting event⁸. Motor competence may be defined as a person's capacity to perform a variety of motor actions, including fine (e.g. hand dexterity) and gross (e.g. static and dynamic balancing) motor coordination⁹. Many forms of skillful movements can be

learned, practiced, and performed better with exercise¹⁰. Both athletes and non-athletes do exercise regularly for the betterment of life. The chance of this engaging in physical exercise is also influenced by motor skills¹¹. On the other hand, regular sporting activities change hematological parameters. It is an important element to show the health and physical condition of the athlete¹². Only by better using all key components of the sports person's skill, coordination, tactics, physical fitness, and psychological amounts can one improve their performance level. Sports, on the other hand, place a large emphasis on component technique coordination¹³. Indeed, sports are one of the most challenging activities since they need such a wide range of movement. As a result, various sports demand different sorts of coordination skills¹⁴. Orientation, Differentiation, Rhythm, Balance, Reaction, Coupling, and Adaptation are the seven talents that make up coordinative abilities and the capacity to analyze and change the motion and location of the body in space and time about a defined movement is known as orientation ability¹⁵. The game of kabaddi demands agility, muscle coordination, breath-holding capacity, fast reactions, and a high level of mental presence¹⁶. To achieve at high levels in competitive sports, all coordinative talents are necessary. Given the importance of orientation and differentiation abilities, it's unknown how the athletes' and non-athletes differentiation and orientation abilities differ. Therefore, the purpose of this study was to compare the orientation and differentiation abilities of men who were athletes and non-athletes.

Aim of the Study

Comparison of selected coordinative abilities between male athletes and non-athletes.

Objectives

The study's objectives are as follows:

- i. To compare the differentiation abilities between male athletes and non-athletes.
- ii. To compare the orientation abilities of men who are athletes and those who are not athletes.

II. Material & Methods

Selection of samples

This research included 20 athletes and 20 non-athletes who were chosen at random. The athletes were chosen from the Paikar Sports Association, Murarai, West Bengal, India, who competed in district-level tournaments in athletics and kabaddi events. Non-athletes from Kabi Nazrul College in Murarai, West Bengal, India, were chosen. The subjects range in age from 20 to 25 years old. Finally, data was collected from Kabi Nazrul College in Murarai, West Bengal, India.

Table-1: The characteristics of the samples (Mean \pm SD)

Items	Athletes group (n=20)	Non-athletes group (n=20)
Age (yr)	21.55 \pm 1.10	21.45 \pm 0.89
Weight (kg)	61.05 \pm 5.91	58.50 \pm 2.93
Height (m)	1.69 \pm 0.043	1.68 \pm 0.036
BMI (kg/m ²)	21.40 \pm 1.98	20.80 \pm 1.36

Selection of Variable's

The following coordinative skills were chosen in consideration of the study's specific purpose:

- i. Differentiation Ability
- ii. Orientation Ability

Criterion measures

The following criterion measures were employed in this study:

- i. The differentiation ability was assessed using the "backward medicine ball throw test," with the score recorded in points as suggested by¹⁷.
- ii. The orientation ability was assessed using the "numbered medicine ball run test," with the score recorded in seconds, as advised by¹⁷.

Procedure for Collecting Data

The Backward Medicine Ball Throw Test: The purpose of the assessment was to measure differentiation skills. 1.5 meters from the starting line, a three-meter-long, six-meter-wide gymnastic mat was put. Inside the middle of the mattress, a 40-centimeter radius circle was formed, and a 2-kg medicine ball was placed in it. Participants were told to form a line behind the initial position, looking the reverse way. To strike the medicine ball in the circle, subjects were asked to throw a 1 kg medicine ball above their heads with both hands, without looking back. The subjects repeated the test twice after one practice trial, with the better performance being noted as the score^{18,19,20}.

The scores are retained as follows:

The score was calculated by adding the total number of points earned in each of the five throws (medicine ball contacting the mattress, 1 point; contacting the round line, 2 points; within the round, 3 points; and touching the 2 kg medicine ball, 4 points).

Medicine Ball Run Test with Numbers: The purpose of this test was to measure orientation ability. Five 3 kg medicine balls were set 1.5 meters apart in a semi-circle on an even surface, with one square foot of metallic numbered 1–5 plates mounted behind the balls. The 6th numbered ball, which weighed 4 kilograms, was separated from the other 1–5 numbered balls by 3 meters. The participants were advised to occupy a position behind the sixth ball, facing the other direction, prior to the test. The participant twisted around and ran to the tester’s number, touching the medicine ball before turning around again. When a different number was called, the tester called it three times in total, and the subject responded as expected. The duration of the course was measured in seconds. The test was administered to the subjects twice, with the better of the two scores being recorded^{18,19,20}.

Statistical Procedures

To compare the selected coordinative abilities between the athletes and non-athletes men’s after collecting relevant data. The SPSS software was used to perform a mean, standard deviation (SD), and unpaired t-test. The significance level was set at 0.05.

III. Results

Table 2: Independent t-test of differentiation (scores) and orientation (seconds) ability between athletes and non-athletes

Variables	Athletes		Non-Athletes		Inferential: Unpaired Sample t-test		
	Mean	SD	Mean	SD	t	df	Sig. (2-tailed)
Differentiation Ability	10.75	1.68	8.55	2.24	3.52	38	0.001
Orientation Ability	6.59	0.51	6.80	0.60	1.20	38	0.238

Significance level at 38 df at 0.05 level =2.024

Table 2 shows that differentiation ability of athletes mean = 10.75 and SD = 1.68, on the other hand non-athletes mean = 8.55 and SD = 2.24 with $t_{(0.05)}(38) = 3.52$ and $p = 0.001$, (2-tailed); whereas, orientation ability of athletes mean = 6.59 and SD = 0.51, other side non-athletes mean = 6.80 and SD = 0.60 with $t_{(0.05)}(38) = 1.20$ and $p = 0.238$, (2-tailed). Finally, the results demonstrate that comparing male athletes and non-athletes, the differentiation ability is statistically significant while the orientation ability is not.

IV. Discussion

To reveal possible variations in orientation and differentiation abilities between male athletes and non-athletes, the results were evaluated using independent t-tests. The study’s findings show that male athletes and non-athletes have considerably different differentiation abilities, whereas their orientation abilities are insignificantly different.

According to⁸ individuals in team sports have been demonstrated to perform much better in terms of orientation and differentiation abilities than competitors in single sports. Researchers²¹ suggest that volleyball players are superior to football players concerning orientation and rhythm abilities, though insignificantly. The demand for orientation ability varies greatly between games. Basketball players’ orientation ability is significantly better than volleyball and football players, according to the findings of the study¹⁵. However, there were no significant differences between volleyball and football players¹⁴. Between athletes and non-athletes, there was a substantial difference in reaction time²², orientation ability, and differentiation ability between cricketers and softball players and finally, cricketers had better reaction ability, orientation ability, and differentiation ability than softball players²³. According to²⁴ results revealed a significant difference in coordination abilities between male volleyball players from Bangalore University and Bangalore Central University. It was discovered that there was no significant difference in reaction ability, orientation ability, or rhythm ability between semi-contact and non-contact athletes. However, there was a considerable difference in differentiation ability between semi-contact and non-contact athletes¹³. One of the two variables of selected coordinative ability, orientation ability, showed a significant difference in male volleyball, basketball, and handball players, and the differentiation ability between selected coordinative abilities has shown no significant difference²⁵. The result found that there were no significant differences in coordination ability between male handball and volleyball players²⁶. In terms of orientation ability, differentiation ability, and balance ability, there was no significant difference between kabaddi and kho-kho players¹⁶. Specific coordinative abilities in non-

athletes, on the other hand, have been observed to show considerable improvements in coordinative ability and kinaesthetic awareness with time. The psychomotor ability to develop is inversely correlated (not considerably) with the progression of school students', India emotional and behavioural difficulties²⁷. However, coordination capabilities make it easier to learn new movements quickly and adapt to a variety of aspects. Daily living and athletic activities necessitate movement talents, particularly coordination abilities, which serve as the foundation for learning movement and maximizing students' abilities. Physical activities that successfully influence movement performance include motor reaction, coordination, balance, and spatial orientation. An early study found that athletes' coordination abilities were considerably higher in three tests (agility, reaction time, and leaps rope) but were unrelated in two balancing tests².

However, when looking at the literature, the results of research done in the individual and team sports categories are similar to the findings of our study. There are also studies whose findings differ from ours. These differences are thought to be caused by the use of different study groups and age categories.

V. Conclusion

Based on the findings of the study it is concluded that the differentiation abilities of male athletes are significantly better than male non-athletes and the orientation abilities of male athletes mean are better than male non-athletes but statistically, it is not significant.

Recommendations

The same study might be repeated with different variables, and similar research on female participants could be conducted. In a similar study, a larger sample of subjects may be used.

Source of Funding: Self

Conflict of Interest: Nil

References

- [1]. Dragnea, C., & Bota, A. (1999). Theory of motor activities: (physical education, sports, leisure activities, physical therapy, body expression activities). *Bucharest: Didactic and Pedagogical Publishing House*.
- [2]. Cristina-Elena, M., & Liliana-Elisabeta, R. (2014). Aspects regarding the level of coordination abilities in both athletes and non-athletes. *Procedia - Social and Behavioral Sciences*, 117, 162–166. <https://doi.org/10.1016/j.sbspro.2014.02.195>.
- [3]. Williams, A. M., Davids, K., & Williams, J. G. (1999). Visual perception and action in sport. London: E & FN Spon.
- [4]. Kalb, L. (1989). Introduction into theory and methodics of training – the performance factor coordination technique. New Delhi, D.V.S.15-25.
- [5]. Kumar, R. (2016). Reaction ability among collegiate school boys students of different body types. *International Research Journal of Management Sociology & Humanity*, 7(8), 100–104.
- [6]. Kumari, P., & Sudhakara, G. (2019). Kabaddi performance with selected coordinative ability of the state level men players of karnataka- a relationship study. *RESEARCH REVIEW International Journal of Multidisciplinary*, 04(02), 901–902.
- [7]. Islam, M. S. (2018). Relationship of abdominal muscle endurance with selected anthropometric measurements in soccer players. *International Journal of Physiology, Nutrition and Physical Education*, 3(2), 1088-1090.
- [8]. Peker, A. T., & Vural, M. (2019). Comparison of some coordinative abilities in terms of team and individual sports. *Journal of Education and Training Studies*, 7(8), 67–72. <https://doi.org/10.11114/jets.v7i8.4333>.
- [9]. Henderson, S. E., & Sugden, D. (1992). The movement assessment battery for children. The Psychological Corporation, Kent, UK.
- [10]. Rahman, M. H., & Islam, M. S. (2020). Stretching and flexibility: A range of motion for games and sports. *European Journal of Physical Education and Sport Science*, 6(8), 22-36. <http://dx.doi.org/10.46827/ejpe.v6i8.3380>.
- [11]. Smyth, M. M., & Anderson, H. I. (2000). Coping with clumsiness in the school playground: Social and physical play in children with coordination impairments. *British Journal of Developmental Psychology*, 18(3), 389–413. <https://doi.org/10.1348/026151000165760>.
- [12]. Rahaman, A. (2021). Analysis of hematological variables among competitors in various games. *International Journal of Research - GRANTHAALAYAH*, 9(5), 360–367. <https://doi.org/10.29121/granthaalayah.v9.i5.2021.3969>.
- [13]. Bisht, R., & Mardikar, M. (2017). A comparative study of selected coordinative abilities among players belonging to semi-contact and non-contact sports of rashtrasant tukadoji maharaj nagpur university, Nagpur. *International journal of researches in biosciences, agriculture & technology*, 5(3), 79–82.
- [14]. Singh, J. (2014). Orientation ability among ball game players: A comparative analysis. *Research Journal of Physical Education Sciences*, 2(10), 9–11.
- [15]. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publication.
- [16]. Abraham, B. (2015). Comparison of coordinative abilities among male players of kabaddi and kho-kho. *International Multidisciplinary Research Journal*, 3(6), 1–3. [https://doi.org/10.1016/S1053-4822\(00\)00031-0](https://doi.org/10.1016/S1053-4822(00)00031-0).
- [17]. Hirtz, P. (1985). *Koordinative Fähigkeiten im Schulsport. Vielseitig, variationsreich, ungewohnt*. Berlin: Volk u. Wissen Verl, 105-107.
- [18]. Chib, S. S. (2000). *Relationship of selected psychomotor variables and coordinative abilities to playing ability in Volleyball*. India: Lakshmbai National Institute of Physical Education Deemed University Degree of Doctor of Doctor Philosophy in Physical Education. 41-45.
- [19]. Minz, A. K. (2003). *Relationship of Coordinative Abilities to Performance in Badminton*. India: Lakshmbai National Institute of Physical Education Deemed University Degree of Master of Physical Education. 1-91.

- [20]. Singh, K. (2004). *Comparison of selected coordinative abilities among sportsmen belonging to contact, semi contact and non-contact sports*. India: Lakshmi Bai National Institute of Physical Education Deemed University Degree of Doctor of Philosophy in Physical Education. 22-35.
- [21]. Nasreen, & Uppal, A.K. (2012). Coordinative abilities of football and cricket players-a comparative study. *International Journal of Physical Education, Health and Sports Sciences*, 1(2), 7-10.
- [22]. Rahman, M. H., & Islam, M. S. (2021). Investigation of audio-visual simple reaction time of university athletes and non-athletes. *Journal of Advances in Sports and Physical Education*, 4(3), 24-29, DOI: 10.36348/jaspe.2021.v04i03.002.
- [23]. Kakran, S. S. (2016). A comparative study on coordinative abilities among male softball players and cricketers. *International Journal of Physical Education, Sports and Health*, 3(1), 34-36.
- [24]. Kumar, T. (2019). A comparative study on coordinative abilities between bangalore university and bangalore central university male volleyball players. *International Journal of Physiology, Nutrition and Physical Education*, 4(2), 58-60.
- [25]. Singh, S. K., & Basumatary, B. (2019). A Comparative analysis on orientation ability and differentiation ability among male volleyball, basketball and handball players. *International Journal of Physical Education & Sports Sciences*, 14(1), 64-68.
- [26]. Lohchab, P. (2014). A comparison of coordinative ability between volleyball and handball male players. *Bhartiya Bhasha, Shiksha, Sahitya evam Shodh*, 5(3), 28-35.
- [27]. De, A., Jana, A., & Bag, S. (2016). A study on coordinative ability and kinesthetics perception in relation to emotional and behavioural problems among santal students. *International Journal of Humanities and Social Science Research*, 2(11), 65-69.

Subrata Pramanick, et. al. "A Study of Specific Coordinative Abilities between Athletes and Non-Athletes." *IOSR Journal of Sports and Physical Education (IOSR-JSPE)*, 9(01) (2022): 42-46.