

Rhythm, Movement Combining and Performance Level of Some Compound Skills in Fencing

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Abstract

Background: Coordination abilities is one of the most important factors necessary to improve the technical performance of learners/players, it varies from skill to another according to the requirements of this skill, the performance of compound fencing skills depends on the player's ability to control the work of different body parts involved in the performance of a certain motor duty. The importance of this research in being one of the studies that are concerned about Identify the most important factors that affect learning compound skills in fencing. **Aim:** This study aimed to identify the impact of Rhythm, Movement combining and performance level of some Compound skills in fencing among female students. **Methods:** Descriptive method used, by using Rhythm, Movement combining and Fencing compound skills tests, on a sample of (110) second year female students on the Faculty of Physical Education, (10) for survey study, (100) for basic study. **Results:** The results showed that there were statistically significant differences between upper and lower groups (Rhythm ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills). There were statistically significant differences between upper and lower groups (Movement combining ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills). The value of the correlation coefficient was statistically significant between rhythm ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack and Defense and riposte skills) ($r = -0.667, -0.558, -0.368, -0.668$) ($p = 0.000, 0.001, 0.045, 0.000$) for the upper group and ($r = -0.496, -0.563, -0.392, -0.558$) ($p < 0.01$) for the total sample. The value of the correlation coefficient was statistically significant between rhythm ability and the level of performance of each (Footwork with defensive positions, and Defense and

riposte skills) ($r = -0.424, -0.394$) ($p = 0.020, 0.031$). And non-significance of (Compound footwork, Compound attack) ($r = -0.170, -0.132$) ($p = 0.369, 0.486$) for lower group. The value of the correlation coefficient was statistically significant between movement combining ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills) ($r = 0.511, 0.456, 0.477, 0.547$) ($p = 0.004, 0.011, 0.008, 0.002$) for the upper group, ($r = 0.412, 0.385, 0.414, 0.456$) ($p = 0.024, 0.036, 0.023, 0.011$) for lower groups and ($r = 0.561, 0.515, 0.315, 0.441$) ($p = 0.000, 0.000, 0.001, 0.000$) for the total sample.

Keywords

Fencing, Rhythm, Movement Combining, Compound Skills

1. Introduction

Coordination abilities is one of the most important factors necessary to improve the technical performance of players, its importance varies from one sport to another, and the importance of each ability varies depending on the type of sport, the higher the requirement of achievement in terms of neuromuscular compatibility, the greater the role of coordination abilities in the result achieved in competition.

(Ezzat, 2007) indicates that coordination abilities are very important in sports with complex skills that require an advanced level of performance control, which is reflected in the availability of a high rate of control during motor performance; resulting in speed of skill performance.

Coordination abilities are closely linked to the development of technical motor skills. Specialized sports activity determines the type of these capabilities. Which need to be developed, Whereas, an individual cannot master the technical skills in a specialized activity if he or she lacks the coordination abilities of this activity (Juliuskasa, 2005; Abu Bshara, 2010).

According to (El-Sayed, 2006), a good level of the player's coordination abilities is available reduces the time required to learn and acquire motor skills, as well as the performance of motor skills economically in the energy exerted.

There are seven co-coordinative abilities identified. These are: 1) Orientation Ability; 2) Differentiation Ability; 3) Coupling Ability; 4) Adaptation Ability; 5) Rhythm Ability; 6) Balance ability; and 7) Reaction Ability. All the co-coordinative abilities are important for learning of sports techniques and for their continuous refinement and modifications during long term training process. The motor learning ability depends to a large extent on the level of co-coordinative abilities (El-Sayed, 2006).

Coordination abilities are the basis for good performance; it varies from skill to another according to the requirements of this skill. It positively affects the speed of learning and mastering compound and complex motor skills, The per-

formance of compound fencing skills depends on the player's ability to control the work of different body parts involved in the performance of a certain motor duty, And linking these parts to a single smooth movement with effective effort, to accomplish that motor duty, as the good performance of the compound skills in fencing depends on the player's ability to combine different movements in a consistency and coordinated framework. And here's the importance of movement combining ability, which (Abu Dari, 2014) defines as being able to combine different kinetic skills directly or sequentially.

In fencing, advanced beginners are taught to do advance-lunge, jump-lunge, and so forth as units (compound units, but still single "chunked" actions). This is both good and bad. Clearly, they must be taught to do a smooth advance-lunge or jump-lunge, because if they do the first part as a preparation and get to the right distance, then pause before they lunge, the opportunity is missed. However, if they always treat an advance-lunge or a jump-lunge as a unit action to be conceived of in advance, they will end up in a situation where they decide that they're at perfect advance-lunge distance, they do a perfect advance-lunge, but the opponent takes an extra retreat, so they lunge into empty space (Gregory A. Jones, 1998).

In the duel we find the fencer performing (retreat—jump—advance—fast advance—long retreat—half retreat—advance—lunge in order to hit the opponent., and we note that it all flows smoothly together without pause, and nobody should believe that he intended from the very start to do all these skills together.

Thus, it is best for beginners to learn simple footwork separately at first in order to perform properly, Then, training on how to combine them, so that composite skills are performed smoothly, this may be affected by the learner's ability to movement combining, it's one of the important coordination abilities of fencers, which affects their performance of compound skills.

Fitts & Posner (1967), suggests that motor skill acquisition follows three stages: the cognitive stage, the associative stage, and the autonomous stage. (Evans, 2013) points out that in the first stage, movements are slow, inconsistent, and inefficient, and large parts of the movement are controlled consciously, the blade movements will be much larger than they should be. Whereas, the goal of education is to improve technical skills; therefore, during the lesson, the two elements of distance/timing should be emphasized, as they are of great importance in fencing. A sense of movement rhythm they have, will accelerate this improvement, on both sides, a sense of motor rhythm, and skills.

During this stage the athlete works at making movement adjustments and stringing together small movement skills. This stage is also called the motor stage, because the problem to be solved in the associative stage is learning how to perform the skill. Schmidt & Lee (2005), Fitts & Posner (1967) and Meinel (1971) agreed that the second stage, "Associative Stage", is where the quality of performance is improved, where the learner can begin to focus on the tempo of the skill and improve the mechanics of movement, for combined skills, the learner

continues at this stage for a long time, the aim of this stage is to get rid of most of the technical errors to achieve a smooth flow of performance.

The smooth flow of motion is the good basis for perfect movement. It means, applying all temporal properties during movement, without stopping, and without any sharp breaks in the geometric paths of the centers of mass of body parts, and the body itself. The temporal rhythm (kinetic rhythm) is the measure of proportionality (or ratio) between parts of movement, and it is obtained by finding the ratio between the lengths of the movement parts, so rhythm is a non-standard amount that reflects the forces applied, they relate to their values, their application times, and other properties of movements. Therefore, with the knowledge of kinetic rhythm, we can “largely” judge the level of mastery and completeness (Al-Fadhli, 2010).

The presence of strict periods of movement, concentrated in large amounts of forces and accelerations, and optimal distribution of these strict periods during the time of movement performance, is important characteristic of motor rhythm. It is sometimes preferable—when acquiring (teaching) skill performances—to start giving the rhythm of the movements rather than elaborating on the details of the movements, this helps to understand and realize faster the skill performance characteristics and how to build it in time. This requires a sense of movement rhythm, and combinatory abilities to perform compound skills. The researcher noted the varying levels of student performance, for combined skills in fencing, which may be due to their different ability to combinatory and sense of rhythm. Therefore, she saw the need to study, the effect of Rhythm, Movement combining and performance level of some Compound skills in fencing. For second-grade female students, the Faculty of Physical Education in Sadat City.

Aim of the Study

This study aimed to identify the impact of Rhythm, Movement combining and performance level of some Compound skills in fencing among female students.

2. Materials and Methods

2.1. Data Collection

- Rhythm test

In this test, rhythmic music is used, where the student jumps by the feet vertically, following the same musical rhythm. The number of correct jumps performed by the student is calculated. The ideal number (maximum) of jumps is (45). The test result represents the difference between the ideal number of jumps (45) and the correct number performed by the student (El-Shafee, A., & Kapouh, N., 2016).

- Movement combining test

The student stands in a ready position on a wooden bar, then begins the test by bouncing a tennis ball on the ground, then holding it by hand with a step forward, records the number of correct repetitions only, in which the ball touched

the ground followed by a step forward, within (30) seconds (Maghayra & Theeb, 2018).

- Fencing compound skills test

Registration is done according to the experts' evaluation (3 experts) of the level of skills performance under study, a score of (10) is awarded for each skill, and this is the method used to estimate the level of skill performance in the faculty. The skills are (Footwork with defensive positions, Compound footwork, Compound attack and Defense-riposte skills).

2.2. Study Method

Considering the nature of the study, the researchers used the descriptive method, which is not limited to data collection and classification, but more, because it includes an interpretation of these data (Abdel-Hamid & Kazem, 2002).

2.3. Participants

The research community is second year female students on the Faculty of Physical Education, Sadat City University for the academic year 2018/2019, They divided into (8) study groups. Participants were (110) female student, (10) for survey study, (100) for basic study, they were selected intentionally, representing (4) study groups, (50%) of the research community. They were divided according to the level of both (Rhythm, Movement combining abilities) individually into three groups (upper group, middle group, lower group), the number of both the upper and the lower groups were (30) students, while the middle group was (40) students.

The skewness coefficient was calculated using "Statistical Package for the Social Sciences" (SPSS), for the research variables it was ranged between (-0.139) and (0.859), this confined between ± 3 which indicates moderating of distribution, or near-moderate distribution of the sample data, which allows the use of parametric statistics.

3. Research Procedures

3.1. Survey Study

The researcher conducted the survey study on a sample of 10 female students from the same research community and outside the research participants in the period from April 14, to April 16, 2019, and for the purpose of rationing scientific coefficients for research tools.

3.2. Scientific Coefficients for Tests

- The validity coefficient For Rhythm was (0.956) and for Movement combining ability, the validity coefficient was (0.934).
- For Rhythm, Movement combining tests, the researcher calculates the test stability by Correlation coefficient using test re-test for responses of the survey sample of (10) female students, the correlation coefficient for Rhythm

test was (0.914), and for Movement combining test was (0.873), which demonstrates that Rhythm, Movement combining tests have a high degree of stability.

3.3. Basic Study

Measurements were conducted for the basic research sample on April 28, to April 30, 2019, which included measuring the Rhythm ability. Movement combining ability, performance level of some fencing compound skills (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills), for female students.

3.4. Statistical Analysis

Statistical treatments were done using “Statistical Package for the Social Sciences” (SPSS), and the following statistical factors were calculated: Mean, median, std. deviation, Skewness, 2-Sample t test and Pearson correlation coefficient.

4. Results

Table 1 showed that there are statistically significant differences between upper and lower groups (Rhythm ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills).

Table 2 showed that there are statistically significant differences between upper and lower groups (Movement combining ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills).

Table 3 showed that:

- The value of the correlation coefficient was statistically significant between rhythm ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills), for both the upper group and the total sample.

Table 1. Significant differences between the upper and lower groups (Rhythm ability) in performance level of some fencing compound skills.

skills	Upper group		Lower group		Mean difference	t
	Mean	Std. Deviation	Mean	Std. Deviation		
Footwork with defensive positions	6.867	1.2794	5.650	1.1076	1.2167	3.938
Compound footwork	6.750	0.9168	5.150	0.8423	1.6000	7.039
Compound attack	6.433	1.4126	5.250	1.0728	1.1833	3.654
Defense and riposte skills	6.783	1.3241	5.117	1.2573	1.6667	5.000

T Table value for df 58 and the level of 0.05 = 2.021.

Table 2. Significant differences between the upper and lower groups (Movement combining ability) in performance level of some fencing compound skills.

Skills	Upper group		Lower group		Mean difference	t
	Mean	Std. Deviation	Mean	Std. Deviation		
Footwork with defensive positions	7.067	0.9803	5.533	1.0080	1.5333	5.973
Compound footwork	6.633	1.2030	5.300	0.8367	1.3333	4.984
Compound attack	6.467	1.3126	5.883	0.8477	0.5833	2.045
Defense and riposte skills	6.533	1.3830	5.350	1.1307	1.1833	3.628

T Table value for df 58 and the level of 0.05 = 2.021.

Table 3. Correlation coefficients between rhythm ability, movement combining ability and some fencing compound skills.

Skills	Groups	N	Mean	Std. Deviation	Fencing compound skills			
					Footwork, defensive positions	Compound footwork	Compound attack	Defense and riposte skills
Rhythm ability	Upper group	30	9.07	1.484	-0.667**	-0.558**	-0.368*	-0.668**
	Lower group	30	19.13	2.432	-0.424*	-0.170	-0.132	-0.394*
	Total	100	13.95	4.241	-0.496**	-0.563**	-0.392**	-0.558**
Movement combining ability	Upper group	30	18.53	2.097	0.511**	0.456*	0.477**	0.547**
	Lower group	30	11.33	0.802	0.412*	0.385*	0.414*	0.456*
	Total	100	14.39	3.143	0.561**	0.515**	0.315**	0.441**

r Table value for df 29 and the level of 0.05 = 0.301; r Table value for df 99 and the level of 0.05 = 0.150; *($p < 0.05$), **($p < 0.01$).

- The value of the correlation coefficient was statistically significant between rhythm ability and the level of performance of each (Footwork with defensive positions, and Defense and riposte skills). And non-significance of (Compound footwork, Compound attack) for lower group.
- The value of the correlation coefficient was statistically significant between movement combining ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills), for both the upper and lower groups and the total sample.

5. Discussion

Table 1 showed that there were statistically significant differences between upper and lower groups (Rhythm ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills). Average of skills performance level for the upper group ranged from 6433 to 6867, while the lower group ranged from 5117 to 5650.

This is consistent with the findings of (Rahal & Al-Atiyat, 2007), that the rhythm had a significant positive effect on improving the performance of offen-

sive skills in fencing. The rhythm also facilitates the process of explaining the skills by showing their parts clearly which Facilitates and develops performance. As the Lack of rhythm ability of the learner/player leads to widening the gap between parts of skills.

(Rahal & Al-Atiyat, 2007) also pointed out, that the sense of rhythm leads to a smooth performance and gives the learner a good, proper and appropriate timing for each section of the movement, which illustrates the complete and clear picture of skill with its different rhythms and contributes to achieving the best level and performance.

The results of **Table 2** showed that there were statistically significant differences between upper and lower groups (Movement combining ability) in performance level of (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills). Average of skills performance level for the upper group ranged from (6.467) to (7.067), while the lower group ranged from (5.300) to (5.883).

These results are consistent with what has been pointed out by (Maghayra & Theeb, 2018) that Fencing skills are governed by certain motion paths that depend on accurate dynamic interconnection, consistent with achievement requirements. They need to combine skills with each other so that the skill or the wholesale is dynamically performed, this strengthens the neural pathway that helps the correct performance and prepares mind to receive skill and avoid mistakes, leading to improved performance.

A study by (Chagas, Ozmun, & Batista, 2017) shows that when mastering the technique of playing volleyball, coordination skills are of paramount importance, this is confirmed by this data which demonstrates the importance of both rhythm and movement combining abilities to achieve a good performance level of fencing skills.

(El-Sayed, 2006) pointed out that coordination abilities emanate from the requirements of skill performance, and do not appear as individual abilities but are always connected to each other, to serve the harmonious composition of the overall movement, If these abilities are coordinated, the highest level of general kinetic compatibility, required to perform precisely motor skills and motor control, can be achieved.

This is confirmed by (Steinhofer, D., 2003) and (Domenico et al., 2008) that the performance level of sports skills in general depends on the skills that the learner has. According to (Grosser, et al., 2008: p. 88; Droge, 2002: p. 77), these abilities have a positive effect on learning speed and mastering complex motor skills, and the learner's lack of a good level of coordination abilities loses the ability to perform properly and shows many technical errors of performance.

The results of **Table 3** showed that the value of the correlation coefficient is statistically significant between rhythm ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills). for both the upper group and the total sample. The correlation coefficients for the upper group ranged from (-0.368*)

to (-0.668**). For the total sample from (0.392**) to (0.563**), while in the lower group there is a correlation between rhythm ability and the performance level of both (Footwork with defensive positions, and Defense and riposte skills). and correlation coefficients were (-0.424*), (-0.394*).

Table 3 results also showed a statistical correlation between movement combining ability and the level of performance of each (Footwork with defensive positions, Compound footwork, Compound attack, and Defense and riposte skills), for both the upper and lower groups and the total sample. The correlation coefficients for the upper group ranged from (0.356*) to (0.547**) and to the lower group from (0.385*) to (0.456*), while the total sample ranged from (0.315**) to (0.561**).

This demonstrates the importance of both rhythm and movement combining abilities, whereas an adequate base of coordination abilities necessary for motor learning at a high level of development, a prerequisite for learning motor skills and applying them effectively. The high level of harmonic abilities is also an indicator of the high technical level of the learner/player, the high level of coordination abilities is an indicator of the high technical level of the learner/player, while the learner's lack of coordination abilities, leads to confusion of performance and reduces its efficiency, whereas, coordination abilities are directly related to and affected by skill performance.

This is consistent with what (Darius, 2011), and (Simonek, 2012) stated as, the higher the level of harmonic abilities of the learner, the higher the level of skill performance, and the lower the performance errors.

This shows that a player with a high level of coordination abilities can achieve an advanced level of skill performance, a good level of coordination abilities reduces the time required to learn and acquire motor skills. This is confirmed by (Hassan, 2005), that coordination abilities are directly related to the skill performance of the player, affect it, as affected by it.

6. Conclusion

The results of the research confirm the necessity of coordination abilities as a basis for controlling the technique of motor actions, which ensures the manifestation of motor qualities for learners/players.

- The availability of a good level of rhythm and movement combining abilities is an important and effective factor in learning compound fencing skills.
- There is a positive correlation between rhythm, movement combining abilities and the performance level of some compound fencing skills.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Abdel-Hamid, J., & Kazem, A. K. (2002). *Research Methods in Education and Psychology*.

- gy. Cairo: Dar Al Nahda Al Arabiya for Publishing and Distribution.
- Abu Bshara, J. (2010). The Impact of a Proposed Training Program on Developing the Level of Coordination Abilities for Football Junior. *An-Najah University Journal for Research (Humanities)*, 24, 1403-1435.
- Abu Dari, A. (2014). *Constructing Criteria for Coordination Abilities of the Age Group (6-9) for Sport Selection* (p. 6). PhD Thesis, Amman: University of Jordan.
- Al-Fadhli, S. A. (2010). Biomechanical Applications in Athletic Training and Motor Performance, Dar Degla, Amman, Jordan.
- Chagas, D. V., Ozmun, J., & Batista, L. A. (2017). The Relationships between Gross Motor Coordination and Sport-Specific Skills in Adolescent Non-Athletes. *Human Movement*, 18, 17-22. <https://doi.org/10.1515/humo-2017-0037>
- Darius, G. (2011). *Level of Selected Indicators of Co-Ordination Motor Abilities in Greco-Roman and Free Style Wrestling*. Warsaw: Jose Pilsudski University.
- Domenico, G., Andrea, C., Riccardo, S., Giuseppe, C., & Giampietro, A. (2008). Relationship between Balance Capacity and Jump Ability in Amateur Soccer Players of Different Ages. *Sport Sciences for Health*, 3, 73-76. <https://doi.org/10.1007/s11332-008-0074-2>
- Droge, W. (2002). *Free Radicalism Physiological Control of Function*. Rockville, MD: American Physiological Society.
- El-Sayed, M. L. (2006). *Sports Achievement and Training Rules: An Applied Vision*. Cairo: Markaz Al-Kitab for Publishing.
- El-Shafee, A., & Kapouh, N. (2016). The Relationship of Developing Coordination Abilities with the Level of Performance of Some Basic Skills of Young Female Basketball. *International Journal of Sports Science and Arts*, 301, 253-276.
- Evans, A. (2013). *Understanding Tempo in the Lesson*. https://www.coachescompendium.org/CUES_IN_TEMPO.HTML
- Ezzat, K. F. (2007). *The Impact of a Qualitative Exercise Program for the Development of Coordination Abilities on Some Aspects of Attention and the Level of Technical Performance to the Judo Youth*. PhD Thesis, Mansoura: Faculty of Physical Education, Mansoura University.
- Fitts, P. M., & Posner, M. I. (1967). *Human Performance*. Belmont, CA: Brooks/Cole.
- Grosser, M., Starischka, S., & Zimmermann, E. (2008). *The New Fitness Training*. Munich: BLV Book Publishing.
- Hassan, H. A. (2005). *Effect of a Proposed Educational Program for the Balance Beam on Coordination Abilities and the Level Skill Performance in Girls at Faculty of Physical Education*. PhD Thesis, Assiut: Faculty of Physical Education, Assiut University.
- Jones, G. A. (1998). *Compound footwork: The Next Step*. <https://www.raincityfencing.com/2014/12/compound-footwork-the-next-step/>
- Juliuskasa, B. (2005). *Relationship of Motor Abilities and Motor Skills in Sport Games*. Brat Slav, Slovakia: Faculty of Physical Education and Sport, Comenius University. <http://www.publications.zu.edu.eg/Pages/PubShow.aspx?ID=23743&&>
- Maghayra, I. A., & Theeb, M. A. (2018). *The Level of Some Harmonic Abilities and Their Relationship to Achievement among Arab Fencers Cubs under 15 Years*. An-Najah University Magazine. https://www.researchgate.net/publication/326032597_mstwby_bd_alqdrat_altwafqyt_wl_aqtha_balanjaz_ldy_almbarzyn_alrb_alashbal_tht_15_snt
- Meinel, K. (1971). *Kinetics. Attempting a Theory of Sporting Movement from an Educational Point of View* (4th ed.). Berlin: Sports Publisher.

- Rahal, B. S., & Al-Atiyat, K. M. (2007). *The Effect of Kinetic Rhythm Program on Developing the Responses of Players to Variables during the Attack Movement by Development in Fencing, Studies—Educational Sciences, Volume 34 Appendix, University of Jordan*. <http://search.mandumah.com/Record/498429>
- Schmidt, R. A., & Lee, T. D. (2005). *Motor Control and Learning: A Behavioral Emphasis* (4th ed.). Champaign, IL: Human Kinetics.
- Simonek, B. (2012). *Prediction of Coordination Performance in Ice-Hockey Players Based on the Structure of Coordination Capacities*. Nitra: Department of Physical Education & Sport “Constantine the Philosopher” University.
- Steinhofer, D. (2003). *Das Athletik Trainings Theorie und Praxis zu Kondition, Koordination und Trainingssteuerung im Sportspiel, Philippike Sportverleg, Muenster*.