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The relationship between orientation and rhythm ability of children doing karate

Alper Tunga Peker* and Mustafa Vural

Department of Physical education and Sports, High school of Physical Education and Sports, Ağrı İbrahim Çeçen University, Ağrı, Turkey.

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The aim of this study is to determine the relationship between orientation and rhythm ability of children doing karate. Children who do karate from Turkey participated in the study. Their age is 14.60 ± 0.82 years; height, 1.60 ± 0.06 m and weight, 53.40 ± 7.01 kg. 20 numbered medicine ball run tests and sprint test with given rhythm were used to determine orientation and rhythm ability of the subjects. The study showed that their rhythm ability affected their orientation performance ($p<0.05$). Rhythm ability ($r=0.456$) displayed a positively significant relationship ($p<0.05$). İn conclusion, the rhythm ability affected the orientation performance of the children. İt is expected that the orientation ability will develop when the rhythm ability is developed.

Key words: Karate, orientation, rhythm, coordinative abilities, exercise.

INTRODUCTION

In many sports, optimal performance requires several components of performance, such as efficient exhibition of motor coordination and behavior and perceptual ability (Williams et al., 1999). In sport science, there are two type of perceptual abilities. One of them is basis sensorial functions that are not for particular types of sport expertise (Williams et al., 1999; Abernethy, 1998). Sport-special perceptual skill is the other type of perceptual process. Studies have displayed that athletes who specialize are superior to rookies in perceptual abilities, such as determining the existence of a ball in sport events in a short time (Allard and Starkes, 1980; Starkes, 1987). It involves searching for relevant, informative parts of the opponent's body and fields, anticipating the direction of the ball and the opponent's action in advance, recalling and recognizing structured scenes of game and play (Garlan and Barry, 1991).

Karate which includies attacking and defence techniques is a well known combat art. İt requires performance outcome based on a point aganist a rival (Imamura et al., 1998; Filingeri et al., 2012; WKF, 2016). Karate movements contain sudden accelerations, directional changes, and sudden, fast and explosive attacks (Soykan et al., 2011). Karate athletes move very fast with short and narrow steps (Masciotra et al., 2001).

Rhythm ability plays a very important role in perception of an externally given rhythm by athletes as well reveals rhythm in many motor activity. The rhythm ability also

Corresponding author. E-mail: tungapeker@hotmail.com.

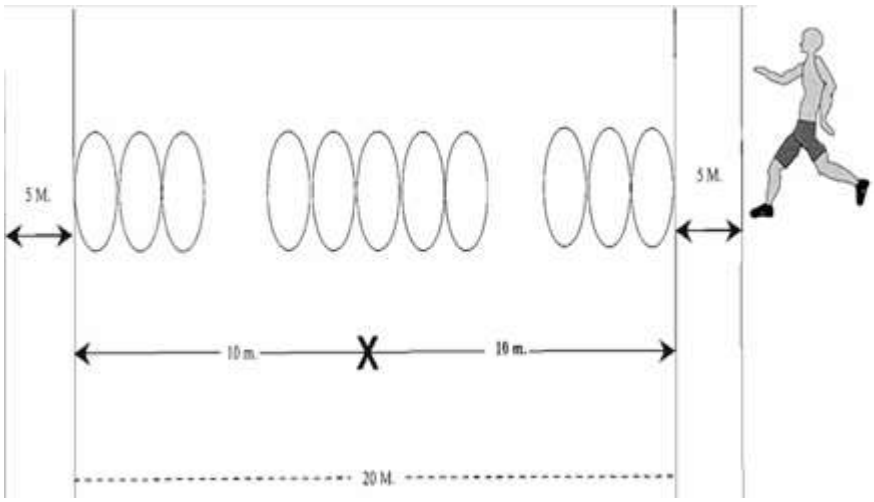

Figure 1. Sprint test with given rhythm.
Source: (Chib, 2000; Minz, 2003; Singh, 2004).

enables athletes to reproduce a rhythm which is in the motor memory in several motor actions (Minz, 2003). Sportsmans have to perceive rhythms given in a musical shape and have to reveal them in their movements in some technical sports such as gymnastics and figure skating. İn many sports, there is no rhythm externally given. In these situations, sportsmans have to use rhythm existing in their memory. This is of vital importance to realize motor learning effectively and to do movements in a high level quality (Singh, 2004).

Orientation can be defined as an ability to identify players' own position, other players and equipment. This ability enables sportsmen to determine the whole body position and body's parts in space and time, as regards gravity (Holmann, 1980). Orientation makes players analyze and change their body's movements or location in time and space associated with defined motion (Singh, 1991). It enables sportsmen to determine and position their body's location and movement or an object's (such as ball, goal, opponents and teammates) location and movement in relation to space (Minz, 2003). The location of the ball, teammates and opponent consistently change during competition, particularly in sports which are performed as a team. Sportsmen have to have orientation ability well to adapt to varying conditions and situations in the game. Orientation ability helps players or athletes who do sport as a team and individually to perceive the game field and implement movements which are correct according to their position in the game field (Sayın, 2011). No study has investigated the relationship between orientation and rhythm ability, besides whether rhythm affects orientation or not in academic literature. Therefore, the aim of this study is to determine the relationship between orientation and rhythm ability of children who do karate.

METHODS

Data collection process

To test our hypotheses, 20 children who do karate from Turkey were assessed. These players were in the same club. To examine the orientation and rhythm performance of karatekas, an orientation ability test (Numbered medicine ball run test) and sprint test with given rhythm were used. Test-retest intraclass reliability for the numbered medicine ball run test, the sprint test with given rhythm were consecutively .92, .93 (Singh, 1991; Chib, 2000; Minz, 2003; Singh, 2004). These tests were performed indoor and conducted on a single day for each test subject.

Subjects

Subjects age was 14.60 ± 0.82 years; height, 1.60 ± 0.06 m and weight, 53.40 ± 7.01 kg. The sample included 20 children who do karate in Turkey. Before data collection, all participants received a detailed explanation of the study's benefits and risks; each subject signed an informed consent form that was approved by the local ethics committee and university.

Sprint test with given rhythm

This test is to determine rhythm ability of the subjects. The subject had to run 30 m-distance with the maximum sprint speed between two lines (starting and finish lines). The sprint time of the subjects was taken by photocell (Smart speed) which was arranged on the lines as starting line and finish line. In the second attempt, the subject had to run at a particular rhythm with maximum speed through eleven hoops which were arranged systematically (Figure 1). Three hoops were kept in a sequence adjacent to each other at a distance of 5 m away from the starting line. Similarly, three hoops were kept at a distance of 5 m away from the finish line. Five more hoops were kept in a sequence in the middle of the running distance. The subject had to run through these hoops stepping between each of them adjusting to the new self-rhythm. This

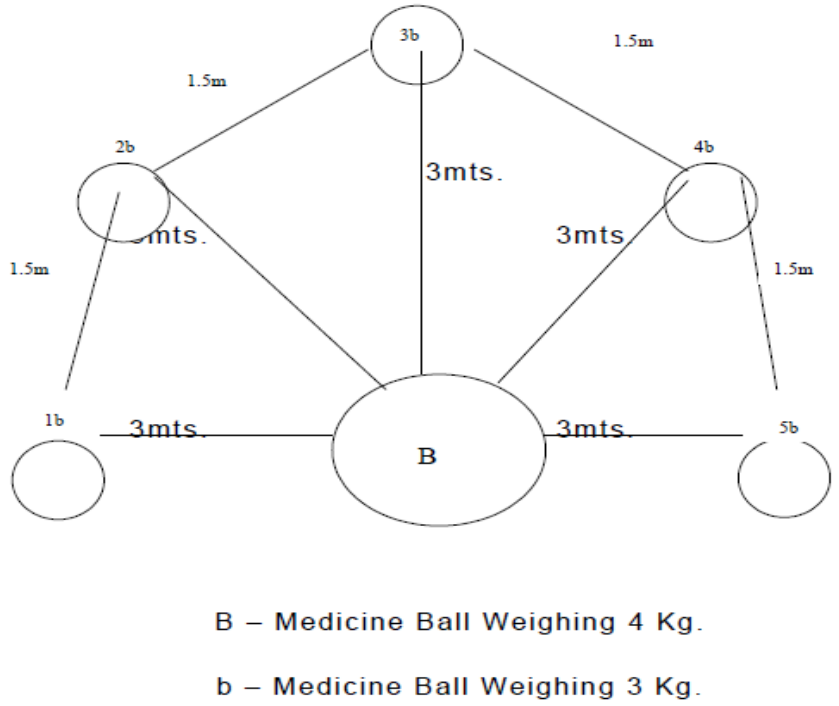

Figure 2. Numbered medicine ball run test subjects.
Source: (Chib, 2000; Minz, 2003; Singh, 2004).

process was explained and demonstrated to the participants then all the participants had one trial to finish test.

Scoring

Difference between the timings of 1st and 2nd attempt was taken as the score (Singh, 1991; Singh, 2014).

Numbered medicine ball run test

This test is to determine orientation ability of the subjects. All the medicine balls weighing 3 kg were arranged (Figure 2) on an even ground in a semi-circle with a distance of 1.5 m between the balls. The medicine balls weighing 4 kg were kept 3 m away from these medicine balls. Behind all the medicine balls of 3 kg weight, metallic number plates of 1 sq foot size were kept from 1 to 5. Before the start of the test, the subjects were said to stand behind the start-finish photocell gate which is behind the sixth medicine ball facing toward the opposite direction. On signal ‘‘ready-go’’, the subjects turn, crossing start-finish gate and run the number called by tester, touch the medicine ball and run back to touch the sixth medicine ball, immediately another number is called. Similarly, a total of three times the number was called by the tester. After the subjects performed accordingly for three times, they completed the test by crossing start-finish gate again. Using a photocell, the tester measures the time between the ‘‘Go’’ signal and crossing the finish gate in units of 0.1 s. Before the actual test was administered, one practical trial was given to all the subjects (Chib, 2000; Minz, 2003; Singh, 2004).

Statistical analyses

SPSS 23.0 IBM statistical software was utilized for data calculation and evaluation. According to the normality test results, Skewness value was 0.319-0.190 while kurtosis value was 0.292-0.378 for rhythm and Skewness value was 0.391-0.190 while kurtosis value was 1.319-0.378 for orientation. Pearson correlation analysis was used to explain the relationship between the measurements. Linear regression analysis was utilized to determine the effects of rhythm ability on orientation performance. Significant level was taken as 0.05.

RESULTS

The mean (SD) age was 14.60 ± 0.82 years; height was 1.60 ± 0.06 m; weight was 53.40 ± 7.01 kg; rhythm ability was 1.82 ± 0.64 s, and orientation was 11.69 ± 1.61s for the 20 karateka children (Table 1). Figure 3 showed that the children’s rhythm ability affected their orientation performance ($p<0.05$).

DISCUSSION

This study is designed to investigate the relationship between the orientation performance and rhythm ability of children who do karate. It is observed that rhythm ability affects orientation performance ($p<0.05$). Rhythm ability

Table 1. Description for athletes (Mean ± SD).

Variable	N	Mean	SD
Age (years)	20	14.60	0.82
Height (m)	20	1.60	0.06
Weight (kg)	20	53.40	7.01
Rhythm (s)	20	1.82	0.64
Orientation (s)	20	11.69	1.61

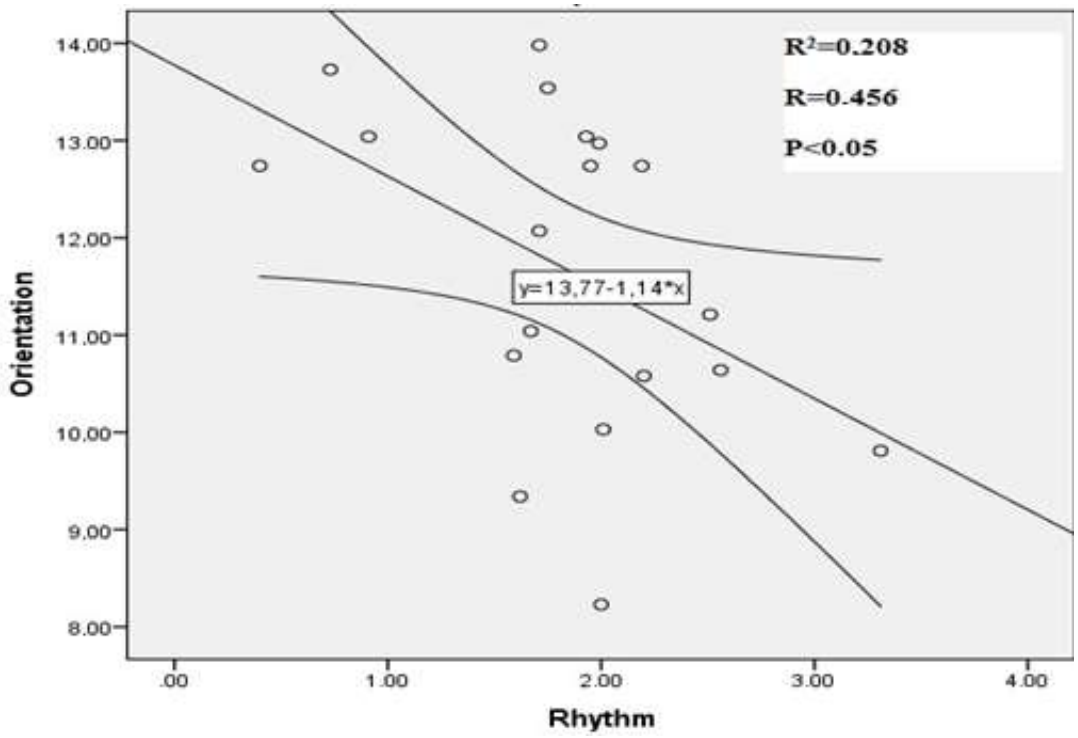

Figure 3. Regression analysis between orientation and rhythm ability.

(r=0.456) displays a positively significant relationship with orientation ability ($p<0.05$). According to Singh (1991), coordinative abilities are very important to exhibit movements optimally and efficiently in many sports. When our findings are evaluated in terms of this knowledge, results can provide valuable information for coach and trainers to improve skills of players.

The relationship between coordinative abilities and the other conditional abilities is unquestionable because for any action that is intended to be prompt, adequate and efficient, what you need first is speed, strength in order to impose it and defeat resistance on the opposite side, especially in the critical moments of contest which usually occur at the end of it. On the contrary, these abilities are not effective in athletic performance unless they are used together with conditional abilities (Smidu, 2014). Besides this, the relationship between a coordinative ability and each one of the other coordinative abilities is amazing.

In a previous study, there was a significant relationship between agility and orientation ability of judokas (Taskin et al., 2017). Singh and Saini (2017) studied the relationship of coordinative abilities with basketball skills. Results of the study showed that there was no significant relationship between rhythm ability and basketball skills. On the other hand, there was a significant relationship between orientation ability and field goal speed test of basketball skills.

In a study, researchers reported that there was a significant relationship between balance ability and playing ability of judokas while there was no significant relationship in terms of rhythm, reaction, orientation and differentiation of coordinative abilities with playing ability

of judokas. In case of wrestler, a significant relationship of balance and differentiation ability with playing ability was found whereas there was no significant relationship between rhythm, reaction, orientation of coordinative abilities and playing ability (Rana and Rajpoot, 2015a). There were several studies which reported orientation ability scores as 10.21±00.56, 11.12±2.67 respectively for North-zone intervarsity team volleyball players and all India interuniversity basketball players. These results are close to the results of our research (Singh, 2015, 2013).
In another study, rhythm ability scores were shown as 2.46±1.22 for volleyball players and 3.23±1.26 for handball players. In addition, orientation ability results were shown as 12.84±1.83 for volleyball players and 11.2±1.11 for handball players (Lohchab, 2014). Researchers investigated the role of coordinative abilities in badminton and table tennis. Results of the study displayed that there was no significant relationship between playing abilities of badminton and table tennis players in terms of orientation ability (Rana and Rajpoot, 2015b). Previous studies showed that researchers examined the relationship between coordinative abilities and playing abilities in some sports. Also they investigated the relationship in terms of agility and orientation, but no study was found on relationship between orientation and rhythm in literature. In conclusion, it can be said that rhythm ability affects orientation performance. It is expected that orientation ability will improve when rhythm ability is well developed.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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