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Sport Participation and Gender Differences in Rhythmic Ability

Ritim Becerisinde Spora Katılım ve Cinsiyet Farkı

Araştırma Makalesi

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ABSTRACT

The purpose of the study was to investigate the role of sport participation and gender on rhythmic ability. Participants were junior competitive male and female tennis players (n= 31, age= 11.61 year, training age= 4.38 year) and non-active male and female controls (n= 32, age= 12.12 year). The High/Scope Rhythmic Competence Analysis Test (RCAT) was used to evaluate the rhythmic ability of participants. The RCAT was conducted with two different tempos of metronome that were 50 beats per minute and 120 beats per minute. An independent-sample t-test was conducted to evaluate the rhythmic abilities of participants. Results revealed that rhythmic ability performance scores of junior competitive tennis players were higher than non-active controls and RCAT

ÖZ

Bu araştırmanın amacı, spora katılımın ve cinsiyetin ritim becerisi üzerindeki etkilerini incelemektir. Araştırma grubunu, genç elit erkek ve kız tenis oyuncuları (n=31, yaş=11,61 yıl, antrenman yaşı=4,38 yıl) ile düzenli bir fiziksel aktiviteye katılmayan sedanter erkek ve kızlar (n=32, yaş=12,12 yıl) oluşturmuştur. Araştırma grubunun ritim becerilerinin ölçümünde belirli metronom vuruşları ile bireyin hareketleri arasındaki senkronizasyonu değerlendirmek için tasarlanan High/Scope Rhytmic Competence Analysis Test (RCAT) kullanılmıştır. RCAT dakikada 50 ve 120'lik metronom vuruşlarındaki farklı iki tempoda uygulanmıştır. Ritim becerisinin spora katılım ve cinsiyete göre farklılığını incelemek için ilişkisiz örneklemler T-testi kullanılmıştır. Araştımadan elde edilen verilere

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scores of male and female participants indicated similarities.

göre, tenis oyuncularının ritim beceri performansları benzer yaş grubundaki sedanterlere göre daha yüksektir. Cinsiyet değişkenine göre, erkek ve kız katılımcıların ritim beceri puanları birbirine benzerlik göstermektedir

Key Words
Tennis, Rhythm, Rhythmic ability

Anahtar Kelimeler
Tenis, Ritim, Ritim becerisi

INTRODUCTION

All coordinated movements are rhythmical and include the temporal sequencing of events and synchronization of actions (Gallahue and Ozmun, 1995). Bourquin (2003) pointed at five coordination skills, which permit tennis players to control, pace, improve and supply rhythm to movements: Orientation, differentiation, balance, reaction, and rhythm. Since the tennis players do not come across with the same ball twice due to different speed, spin, and the height of the ball, coordination is a very demanding ability for tennis (Bourquin, 2003).

Rhythm is the dynamic grouping, structuring and accentuation of sequential elements of a process, the arrangement of which is determined by a required and/or personally selected temporal scheme (Schönborn, 2003). Previous studies reported the existence and importance of rhythm in sport skills such as in swimming (Weikart, 1989), ballet (Laurence, 2000), dance (Kirchner and Fishburne, 1995), gymnastics (Pica, 1998), fencing (Borysiuk and Waskiewicz, 2008), basketball and tennis (Zachopoulou et al., 2000). Specifically, according to Bourquin (2003), the role of rhythm is important for tennis players to achieve harmonious movements.

Zachopoulou et al. (2000) dwelled on the paucity of information about the impacts of sport participation on rhythmic ability and investigated the rhythmic ability of 50 tennis players (9.5 $\pm$ 5.2 years old), 53 basketball players (9.8 $\pm$ 6.3 years old), 52 swimmers (9.2 $\pm$ 4.2 years old), and 52 controls. While the rhythmic abilities of the children in the sport groups were found more accurate than the controls, so were the rhythmic ability test scores of tennis players than the other three groups. It was claimed that all movements in tennis require distinct rhythmic structures, and practicing these movements creates opportunities for experiencing different tempos of rhythm, i.e. for rhythmic actions.

Previous studies showed no consensus about the effects of gender on rhythmic ability. Studies of Groves (1969), Smoll (1975), and Zachopoulou et al. (2000) reported that gender has no effect on rhythmic ability. On the other hand, Schleuter and Schleuter (1985), Weikart (1989), and Haines (2003) pointed out that gender is a differentiating factor for rhythmic ability and girls are more accurate than boys. According to Weikart (1989), certain activities like jumping rope and dancing which girls are more likely to do create opportunities for girls to excel at rhythmic movements.

The current study aimed to provide data in this field by investigating the role of sport participation and gender on the rhythmic ability. Thirty-one junior competitive tennis players and 32 non-active controls participated in this study. Since the nature of tennis game provides opportunity for players to be acquainted with different rhythmic movements, the participants in the tennis group were expected to exhibit higher rhythmic ability scores than participants in the control group. The rhythmic abilities of male and female participants were investigated regardless of their groups (either tennis or control), and no effects of gender differences were expected.

METHODS

Participants: Participants were junior competitive male and female tennis players (n= 31, age=11.61 year, training age= 4.38 year) and non-active male and female controls (n= 32, age= 12.12 year). All participants were informed on the nature and purpose of the study both verbally and in written form. Table 1 presents descriptive statistics related to the participants.

Measurements: The High/ Scope Rhythmic Competence Analysis Test (RCAT) (Weikart, 1989) was used to assess the rhythmic abilities of the participants for both tempos of 50 and 120 beats per minute (bpm). Weikart (1989) designed RCAT in order to evaluate an individual's rhythmic ability by testing his/her ability to perform a movement task in accordance with the underlying steady beat. A standard metronome was used for all tests.

Procedures: The RCAT was administered in a silent room. The participants were tested individually after they had been familiarized with the nature of the tasks and the testing environment. The scores were videotaped so that the performance could be analyzed in RCAT. Each participant was asked to synchronize a series of six movements for six times, and the observers analyzed a total of 36 movements. The mean scores for each task were determined by averaging the scores of the two observers. The movements were as follows: 1) Patting the thighs with both hands at the same time, 2) Patting the thighs alternating the hands for each pat, 3) Walking the beat while still seated, 4) Walking the beat in one place, 5) Walking forward, and 6) Walking backwards.

Two observers independently scored the videotaped tests for each movement. They used a 1-3, scale where 3 was assigned to the movements that are accurately synchronized, 2 to the nearly synchronized movements, and 1 to the non-synchronized movements. In order to evaluate the intra-observer agreement, two observers observed the videotaped RCAT performance of 22 participants for each tempo. Furthermore, to assess the inter-observer agreement, the same observers observed videotaped RCAT performance of 22 participants twice at two different times. Observer agreement for RCAT was calculated according to the following formula (Van Der Mars, 1989): Percentage of agreements = [Number of agreements / (Number of agreements + Disagreements)] x 100. Two observers agreed on 84% intra-observer reliability for the tempo of 50 bpm and 81% intra-observer reliability for the tempo of 120. Observers agreed on 83% inter-observer reliability for the tempo of 50 bpm and 80% for the tempo of 120 bpm.

Table 1. Descriptive statistics about the participants' age and tennis training age

Grup/ Parameters		N	Age (year)		TTA (year)	
			M	SD	M	SD
Tennis	Male	17	11.41	0.50	4.17	1.32
	Female	14	11.85	0.36	4.64	1.42
Control	Male	18	12.11	0.47		
	Female	14	12.14	0.53		

Note: TTA = Tennis Training Age

RESULTS

Two independent sample t tests were conducted to examine whether there was a significant difference between competitive tennis players and non-active controls in terms of rhythmic ability performance at 50 and 120 bpm. The means and standard deviations for rhythmic ability scores of groups are presented in Table 2.

The test results indicated significant difference between each tempo (50 [t (61)=2.15, p< .05] and 120 [t (61)=2.07, p< .05]) of groups. The RCAT scores of competitive tennis players [50 (M= 1.39 and 120 (M= 1.52)] were higher than the scores of those in the control group [50 (M=1.24) and 120 (M= 1.34)] for both tempos. There was no significant difference between RCAT scores (50 [t (61)= -.27, p> .05] and 120 [t (61)= -.94, p> .05]) of male and female participants in either tempo.

DISCUSSION

The purpose of the study was to investigate the role of sport participation and gender on the rhythmic ability. It was hypothesized that the participants in the tennis group were expected to exhibit higher rhythmic ability scores than participants in the control group. The results of the study revealed that rhythmic ability performance scores of junior competitive tennis players were higher than the non-active controls in both tempos. This result is in accord with the findings of Zachopoulou et al. (2000). They pointed out that all movements in tennis require distinct rhythmic structures, and practicing these movements creates opportunities for rhythmic actions through experiencing different tempos of rhythm. Supportively, according to Zachopoulou et al. (2003), progression of children's rhythmic ability and other abilities depend on the maturation of basic functions of the central nervous system and their stimulation with practice. Additionally, the nature of tennis game provides opportunity for players to develop their own rhythmic patterns before they perform groundstroke, volley or serve. These movements can be observed from their pre-performance rituals, footwork and strokes. According to Magill (2004), pre-performance rituals have effects on performance through stabilizing the motor control system.

Rhythmic abilities of male and female participants were investigated regardless of their groups (either tennis or control), and no effects

Table 2. T-test results of rhythmic ability scores for group and gender variables

Rhythmic ability	Tempo	N	M	Sd	df	t	p
Tennis	50	31	1.39	0.32	61	2.15	.035
Control		32	1.24	0.21			
Tennis	120	31	1.52	0.38	61	2.07	.042
Control		32	1.34	0.28			
Male	50	35	1.30	0.25	61	-.27	.788
Female		28	1.32	0.31			
Male	120	35	1.40	0.30	61	-.94	.349
Female		28	1.48	0.40			

of gender differences were expected. The results of the study indicated that the RCAT scores of male and female participants indicated similarities for both tempos. This result contrasts with the findings of Schleuter and Schleuter (1985), Weikart (1989), and Haines (2003). They pointed out that gender is a differentiating factor for rhythmic ability and girls are more accurate than boys. However, our results confirm the previous studies of Groves (1969), Smoll (1975), and Zachopoulou et al. (2000), who stated that gender has no effect on rhythmic ability. Groves pointed out that gender is not an important factor as previous motor experience.

In conclusion, this present study focused on the analysis of the rhythmic abilities of junior competitive tennis players and non-active controls. The effects of sport participation and gender were investigated. It can be concluded that participation in the regular tennis training has a positive effect on rhythmic ability performance. Additional studies focusing on determining the rhythmic patterns of tennis strokes and analyzing the rhythm of tennis match regarding the age and gender are recommended.

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