Journal of Novel Applied Sciences
Available online at www.jnasci.org
©2015 JNAS Journal-2015-4-5/566-572
ISSN 2322-5149 ©2015 JNAS

The effects of competitiveness type and audience on learning of a badminton short service motor skill

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ABSTRACT: The purpose of this study was to examine the effects of competitiveness type and audience on learning and performance of a badminton short service. 40 male students were voluntarily selected from Islamic Azad University Brojoured Branch of Iran by available sampling. The subjects who had high scores in the Sport Orientation Questionnaire (SOQ) test were selected as competitive people (N=20) and the subjects who had lowest scores in this test were selected as non-competitive people (N=20). Each of them was divided into two groups: a. the audience presence (N=10), b. without the presence of an audience (N=10). The instrument for collecting in data is included the Sport Orientation Questionnaire (SOQ) and a badminton short service practical test. The analysis of data were done by the two-way ANOVA and independent and dependent t-test ($p<0.05$). The results of this study showed that there is a significant difference between the competitive and non-competitive group. The competitive group had a better performance and learning than the non-competitive group. Also the audience presence group had no better performance and learning than without the presence of an audience group. The results showed that the competitive group in the presence of an audience had the best performance in the execution and learning of a badminton short service. In addition, learning of a badminton short service is improved in the competitive subjects with the increasing of competitive environment (the audience presence).

***Keywords*:** competitiveness, audience, learning, motor skill, badminton.

INTRODUCTION

Human is constantly learning in different ways to interact with own life environment from the beginning to the end of life. One of the human concerns had been surely learning especially the learning of different movements. Indeed, the motor learning constitutes the basis of human activity and it means the acquisition of a skill or retraining using practice (Gill, 2004). The distinguished human ability in the execution of movements and complex skill is an important characteristic of his/her ability among other organisms. Thus the execution of movements requires a special condition from learning and practice aspects that the execution of movements is not possible without them (Gill, 2004). For example, although the emergence of the basic skill of walking is hereditary in human but external examples such as the instructional environment, parents' encouragement, and etc. are important in the quality of achieving this skill. Human needs help in everything that its need is movement to learn and perform the skills that are related to that thing. In this regards, the researchers in the field of motor behavior and related sciences such as psychology have sought to understand the concepts that are related to the principles of motor skills learning and the finding of appropriate strategies to provide the coaches and sports teachers with the conducting many studies (Maleki, 2005). It was believed in the past that a person's ability in learning is merely a function of his/her intelligence and talents. But the assumption has been common among psychology in recent years that non-intrinsic factors such

as self-improvement strategies that create the achievement motivation and improve cognitive problems can be very effective in the learning process in addition to the above factors that play a decisive role (Maleki, 2005). So the different environmental factors can affect on the learning of athletes' skills. The competition is one of these factors and inevitable part of sport. The professional and novice athletes' abilities are usually valuated in the competitive situations (Kim, 2002). The study of individual differences that is a major axis of differential psychology has become an important issue in sport psychology. The differential psychology deals with the study of individuals differences in comparison with the normal behavior or behavior of others. The individual differences in the level of competitiveness are a controversial topic in differential psychology and it is different among different individuals (Scanlan, 1991). The competitiveness has theoretical foundations in the field of achievement motivation and arousal. Competition is a motivational factor that increases arousal and it is a process that a person's performance is compared during it with some standards and the presence of another person who is aware of the scale and she/he can evaluate the comparison process. The achievement motivation is usually called competitiveness in sport (Scanlan, 1991). Psychologists believe that the achievement motivation (competitiveness) is a desire and enthusiasm or effort that the person shows to achieve a goal or the mastery of objects and individuals, and thoughts, and to attain an excellent standard of self. This desire and effort is high in the competitiveness people. Arousal that is synonymous with terms such as activation, readiness, and excitement in the psychology literature is a necessary prerequisite for optimal sports performance (Gould and Weinberg, 2003). The athletes' preparation for the best performance is highly related to the moderating of arousal levels in sport psychology. In fact, arousal is defined as a range of physiological and psychological activities in the continuum of deep sleep to intense emotions (Weinberg and Gould, 2003). The importance of task, audience presence, reinforcement, feedback, music, and physical activity are important motivational factors that have been applied in the creating of arousal in the different studies and the researchers believe that those are effective factors on the learning of skills (Kim et al., 2002). According to the different theories, the effectiveness of arousal on execution is depends on the person's interpretation of arousal levels that if this arousal levels are interpreted the pleasure, anxiety, or negative mood, the execution will be strengthening or weakening (Bray and Widener, 2000). So the effective factors on arousal such as music and audience can affect on the person's interpretation of it and learning as well. The different studies have emphasized on the importance of each of motivational interventions on the learning (Bray and Widener, 2000; Courneya; Scanlan, 1991). Anshel, (2001) and Scanlan (1979) stated that the effect of audience presence on athletes' performance is a source that affects on anxiety. Supporting spectators bring environment comfort to let players feel comfortable in a competitive environment which results in increasing of both self- confidence (Courneya and Carron, 1992) and team-efficacy (Bray and Widmeyer, 2000) and hence facilitate players' performance. Carron, (2005) examined the effect of audience presence on home advantage in sport competitions. They concluded that according to the social facilitation theory, the audience presence can increase the percent of basketball free throwing. Bagherzadeh, (2003) showed that the audience presence has no significant effect on fine and gross motor skills. Croce and Rocks, (1991) studied the effect of peer presence on the fine-motor performance of adults with mental retardation. They stated that subjects experienced high stress levels in the audience presence. Today, sport psychologists study the effects of audience presence on athletes' performance in the form of social facilitation that Alport first proposed it. The results of previous studies show that the increasing of arousal can improve the performance in a particular size but further increase results in weaker performance. This effect is known as the Inverted – U principle and Yerkes and Dodson, (1908) proposed this principle. According to this principle, we can have a good execution in the optimal level of arousal. On the other hand, some theories believe that Inverted – U principle has limitations in the description of the relationship between arousal and performance such as the relationship between arousal and performance is not always linear (Jonse, 2006). The initial theories stated that arousal should be increased in the athletes before and during performance but arousal is a complex phenomenon. It means that the high levels of arousal cause that individuals focus their attention on different sources at every moment that some resources provide the irrelevant information. Thus individuals ignore some related cues (Kahneman, 1973). These theories believe that the audience presence affects on individuals' attention and their performance. Triplett, (1997) studied the individual and team cyclists' record. He expressed that team cyclists had better records that individual cyclists. So he showed the effects of other individuals' performance on an individual's performance. In this regards, Noteboom, (2010) examined the acquisition and retention of basketball free throwing in two types of training environment with high and low arousal. The results showed that there is no significant difference between these two types of training environment in the acquisition and retention of basketball free throwing. But the subjects' performance decreased significantly when the groups were tested in the different arousal from their training environment. Hanin, (2009) studied dart throwing in 20 male students. The subjects were divided into two groups (competitiveness and non-competitiveness). They participated in 10 training sessions that every session was contained 40 blocks. The results showed that the there is no significant difference between competitiveness and non-competitiveness groups in the performance. Bathurst, (2008) studied

the effects of audience and home advantage in female gymnastics. The results show that the scores of home competitions were significantly higher than competitions that were out of home and in the audience presence and team had better performance in home competitions. These studies show that only performance and sometimes the athletes' acquisition have independently studied in competitiveness environments and in the audience presence. It seems that the conducting a more comprehensive study is necessary. A study that can be examined the effects of these factors on learning of motor skills at the same time. This study will present more accurate and complete information for us. There are few studies about the effects of competitiveness and audience presence on learning of motor skills. Only the effects of the environmental situation on performance, the competitive personality traits and the interaction of competitive situation and competitiveness personality characteristics on individuals who have not participated in training sessions were examined in some studies. Therefore it is essential that the interaction of individual and environment on the learning of a sport skill is studied. Thus this study wants to examine the effects of competitiveness type and audience on learning of a badminton short service motor skill.

MATERIALS AND METHODS

Method

This study was a semi empirical research and design of it is included between 4 groups with pre-test and control group.

Participants

The statistical population of this study was all male students in Islamic Azad University Brojoured Branch of Iran. 40 male students were voluntarily selected from by available sampling. According to the pre-test, the subjects were divided into 4 groups (N= 10).

Instruments and Tasks

The instrument was a demographic questionnaire to collect individual data and the Sport Orientation Questionnaire (SOQ), and a badminton short service practical test.

Procedure

The subjects who had high scores in the Sport Orientation Questionnaire (SOQ) test were selected as competitive people (N=20) and the subjects who had lowest scores in this test were selected as non-competitive people (N=20). Then, each of them was divided into two groups: a. the audience presence (N=10), b. without the presence of an audience (N=10). Thus, tis study was included four groups: a. Competitive (audience presence) b. Competitive without the presence of an audience c. Non-competitive (audience presence) d. Competitive without the presence of an audience. The subjects participated in 6 training sessions every other day that every session was contained 3 blocks with 10 trails). French Badminton Short Service Test was used for the execution of badminton short service. The acquisition test was performed immediately after training sessions. The subjects participated in the retention test after 48 hours without practice. They had 5 trails before the performing of retention test. Then the transfer test was performed. The audience was asked was to encourage subjects at all stages of training (acquisition, retention, and transfer) on the basis of research method. The audience was silence in the moment of performance. Then they began to encourage after the performance and the determining of result. The encouragement was included verbal and non-verbal with clapping, whistling, and motivational terms by the mentioning of participants' name (Movahedi, 2007).

Data Analysis

The collected data were classified by descriptive statistical methods and were analyzed by the two-way ANOVA and independent and dependent t-test ($p<0.05$). The SPSS software (version 21) was used for data analysis ($\alpha \leq 0.05$).

RESULTS AND DISCUSSION

Results

The results of table (1) show the mean and the standard deviation of subjects' age. The results of table (2) show the mean and the standard deviation of pre-test, acquisition, retention, and transfer test.

Table 1. The mean and standard deviation of subjects' age

Group	N	Age	
		Mean	SD
Competitive (audience presence)	10	21.25	1.754
Competitive without the presence of an audience	10	20.75	2.2224
Non-competitive (audience presence)	10	22.15	1.761
Non-competitive without the presence of an audience	10	21.55	2.044

Table 2. The mean and the standard deviation of groups in the pre-test, acquisition, retention and transfer stages

Group	N	Pre-test M±SD	Acquisition M±SD	Retention test M±SD	Transfer test M±SD
Competitive	20	3.45±0.94	1.04±6.60	1.35±6.40	1.26±5.70
Non-competitive	20	1.11±3.25	1.00±5.50	0.63±5.25	0.55±4.75
Audience presence	20	1.07±3.25	1.21±6.30	1.23±6.15	1.27±5.55
without the presence of an audience	20	0.99±3.45	1.05±5.80	1.10±5.50	0.71±4.90
Competitive (audience presence)	10	0.97±3.50	0.63±7.20	1.05±7.00	1.33±6.30
Competitive without the presence of an audience	10	0.96±3.40	1.05±6.00	1.39±5.80	0.87±5.10
Non-competitive (audience presence)	10	1.15±3.00	0.96±5.40	0.67±5.30	0.63±4.80
Non-competitive without the presence of an audience	10	1.08±3.50	1.07±5.60	0.63±5.20	0.48±4.70

Table 3. The results of Levene's test for the determination of homogeneity of variance between groups in the pre-test

The difference of between groups	df	Levene	P
Pre-test	(3, 36)	0.101	0.959

Table 4. The results of ANOVA for the determination of difference between groups in the pre-test

The difference of between groups	Df	F	P
Pre-test	(3, 36)	0.518	0.673

Table (3) shows the results of Levene's test for the determination of homogeneity of variance between groups. According to table 4, it is observed that there is no a significant difference between groups in the pre-test (P = 0.673). The results of Kolmogorov-Smirnov Test has shown to assess the normality of the data in the table5.

Table 5. The results of Kolmogorov-Smirnov Test

Group	Z	Sig	Z	Sig	Z	Sig	Z	Sig
Competitive (audience presence)	0.938	0.343	1.025	0.244	0.723	0.673	0.631	0.820
Competitive without the presence of an audience	1.140	0.148	0.723	0.673	0.684	0.737	0.784	0.570
Non-competitive (audience presence)	0.632	0.819	0.736	0.651	0.859	0.452	1.025	0.244
Non-competitive without the presence of an audience	0.564	0.908	0.775	0.585	1.025	0.244	1.068	0.216

Table 6. The results of ANOVA test for the determination of difference between performance of audience presence and without the presence of an audience in the acquisition, retention, and transfer stages

Effect	F	Df	P	Effect size
Practice (test sessions)	545.85	F(38,1)	0.000**	0.935
Group	4.56	F(38,1)	0.039*	0.107
Test sessions × Group	15.16	F(38,1)	0.000**	0.285
Practice (test sessions)	207.14	F(38,1)	0.000**	0.845
Group	5.69	F(38,1)	0.022**	0.130
Test sessions × Group	7.63	F(38,1)	0.000**	0.167
Practice (test sessions)	90.95	F(38,1)	0.000**	0.705
Group	5.31	F(38,1)	0.027*	0.123
Test sessions × Group	3.63	F(38,1)	0.064	0.087
Practice (test sessions)	471.52	F(38,1)	0.000**	0.925
Group	0.21	F(38,1)	0.643	0.006
Test sessions × Group	7.92	F(38,1)	0.008**	0.173
Practice (test sessions)	199.16	F(38,1)	0.000**	0.840
Group	0.55	F(38,1)	0.459	0.014
Test sessions × Group	5.87	F(38,1)	0.020*	0.134
Practice (test sessions)	93.50	F(38,1)	0.000**	0.711
Group	0.728	F(38,1)	0.399	0.019
Test sessions × Group	4.80	F(38,1)	0.035*	0.112
Competitive type	13.44	F(38,1)	0.001**	0.272
audience presence	2.77	F(38,1)	0.104	0L072
Competitive type × audience presence	5.44	F(38,1)	0.025*	0.131
Competitive type	13.48	F(38,1)	0.001**	0.367
audience presence	3.08	F(38,1)	0.088	0.107
Competitive type × audience presence	4.30	F(38,1)	0.025*	0.131
Competitive type	11.32	F(38,1)	0.002*	0.239
audience presence	3.79	F(38,1)	0.059	0.095
Competitive type × audience presence	5.30	F(38,1)	0.027*	0.128

According to table 6, it is observed that

- There is a significant difference between two types of competitiveness levels in the performance of a badminton short service motor skill in the acquisition, retention, and transfer test. The effects of practice are significant too.
- The audience presence has no significant effects on the performance of a badminton short service motor skill in the acquisition stage.
- The audience presence has significant effects on the learning of a badminton short service motor skill in the retention and transfer stages. The effects of practice are significant too.
- There is a significant difference between subjects in different levels of competitiveness type with the audience presence in the execution of motor skill. The effects of competitiveness and non-competitiveness levels are significant. But there is no significant effect between with and without the audience presence in the acquisition test. Also, the study of the interaction effect of competitiveness type, audience presence shows that there is a significant difference between competiveness effect with and without the audience presence conditions in the acquisition test.
- The effects of competitiveness and non-competitiveness levels are significant between subjects with different levels of competitiveness types for the learning of a badminton short service motor skill in the retention and transfer stage with the audience presence. But there is no significant effect between with and without the audience presence in the retention and transfer stage. Also, the study of the interaction effect of competitiveness type, audience presence shows there is a significant difference between competiveness effects with the and without the audience presence conditions in the retention and transfer test.

Table 7. The results of dependent t-test for the determination of between and within group differences difference in the pre-test and acquisition with and without the audience presence

Group	Difference Mean	t	df	Sig
Competiveness	3.15±0.87	16.09	19	0.000**
Non-competiveness	2.25±0.55	18.29	1	0.000**
Competiveness- Non-competiveness	1.10±0.32	3.39	38	0.002**
audience presence	3.05±0.99	13.65	19	0.000**
without the presence of an audience	2.35±0.48	21.47	19	0.000**

According to table 7, it is observed that

- There is a significant difference between competitiveness and non-competitiveness groups in the acquisition stage (P<0.05).
- There is a significant difference between with and without the audience presence groups in the pre-test and acquisition stage (P<0.05).

Table 8. The results of dependent t-test for the determination of between and within group differences difference in the retention and transfer test with and without the audience presence

Group	Test	Difference Mean	t	df	Sig
Competiveness	Pre-test-retention	2.95±1.05	12.56	19	0.000**
	Pre-test-retention	2.25±1.16	8.64	19	0.000**
Non-competiveness	Pre-test-retention	2.00±1.12	7.95	19	0.000**
	Pre-test-retention	1.50±1.31	5.09	19	0.000**
Competiveness- Non-competiveness	Pre-test-retention	1.15±0.33	3.43	38	0.001**
	Pre-test-retention	0.95±0.30	3.08	38	0.004*
audience presence	Pre-test-retention	2.90±1.16	11.13	19	0.000**
	Pre-test-retention	2.30±1.45	7.07	19	0.000**
without the presence of an audience	Pre-test-retention	2.05±1.05	8.73	19	0.000**
	Pre-test-retention	1.45±0.94	6.86	19	0.000**

According to table 8, it is observed that

- There is a significant difference between competitiveness and non-competitiveness groups in the gained score mean from the pre-test to retention and transfer test (P<0.05).
- There is a significant difference between with and without the audience presence groups in the gained score mean from the pre-test to retention and transfer test (P<0.05).

Also the results of independent t-test show that there is a significant difference between competitiveness and non-competitiveness groups in the retention and transfer test ($P<0.05$).

Discussion and conclusion

This study examined the effects of competitiveness type and audience on learning of a badminton short service motor skill. The results of this study showed that the performance of competitiveness and non-competitiveness (apart from without or with the audience presence) groups improved significantly in the acquisition, retention, and transfer than pre-test stage. Also, the competitiveness group had better performance than non-competitiveness group in the acquisition, retention, and transfer. In addition, the performance of with and without audience presence (apart from competitiveness type) groups improved significantly in the acquisition, retention, and transfer than pre-test stage. The results of the test of competitiveness type and the audience presence showed that the competitiveness group had the best performance in the acquisition, retention, and transfer stage. While the audience presence or without the audience presence had no significant effects on the non-competitiveness subjects' learning and performance during their training. The results of this study are consistent with the results of Carron, (2005); Triplett, (1997); Franken, (1994); Martens, (1969) (in the retention stage); Teimuri , (2011); and Habibi's (2010) study. The possible reasons for consistent of these studies can be the use of same patterns in terms of subjects' skill level (novice) and age group. The results of this study are conflict with the results of Bagherzadeh, (2003); Fort, (2008); Martens, (1969) (in the acquisition stage); Shahbazi, (2011); Jamshidi, (2008); and Butki's, (1994) study. Perhaps, lake of consistent of these studies with this study is due to factors such as subject's gender, age, skill level, used task type, and competitiveness level. Shahbazi, (2011) used the Electric Depth Perception Tester. The use of this tester needs a high attention. The results of their study showed that the subjects had an incorrect estimation of depth perception in the high motivational environment (in the presence of an audience) that this effect was similar in both genders. So, novice athletes pay attention to environmental cues and information sources in a high motivational environment in comparison with a low motivational environment. It leads to an incorrect estimation of depth perception. However the results of this study indicate that a high motivational environment is useful for individuals' learning that have competitive personality even if they are novices. The all subjects of this study are novice so we can conclude that the creation of a motivational environment will be effective for the competitive individuals' learning even if they are novice. Because the increasing of these individuals' arousal improve the learning of desired skill. According to the previous studies, the audience presence is one of arousal resources that it increases the narrow focus of attention and distraction from irrelevant cues. Audiences are an effective factor in sports performance. It is observed that athlete has a high performance during trainings but he/she shows a poor performance in the competition or vice versa (Rahmaninia, 2003). Therefore the individual differences in the presence of an audience or with out audience presence depends on the individuals' personality traits that they have competitive or non-competitive spirit. Bagherzadeh, (2003) stated that the audience presence accelerates the better learning and performance of motor skills. On the other hand Croce and Rocks, (1991) studied the effects of peer presence on the fine-motor performance. They concluded that subjects experienced high stress levels in the presence of an audience. These results shows that the increasing of arousal can improve the performance in a particular size but further increase results in weaker performance. This effect is known as the Inverted U theory. According to this theory, we can say that this theory is different in individuals with different competitiveness level so that the individuals' motivation sources are different too. Thus it is important that we be aware of individuals' high and low motivation to achieve their goals. According to the results of this study and other studies about this area, a competitive environment is an effective factor in motor performance. We should know that the identifying of individuals' personality traits affects on the athletes' performance. The important finding of this study is that individuals' differences are effective factors in performance in the competitive environments. It should be designed different competitive environments for individuals with different arousal competitive traits to execute their best performance. The results of studies such as this study provide an opportunity for coaches and athletes to indicate the effects of these factors on execution and performance of motor skills and to strengthen their weakness by intervention methods. According to the results of this study, individuals' different affects from different competitive environment may be due to involved abilities in those skills. Therefore, the conducting of more studies is essential to affirm this assumption. In addition, the study of effects of different levels of competitiveness on each of these abilities, the discrete and continuous skills, and tasks with different cognitive and motor needs should examine further in future studies.

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