Effectiveness of Shadow Practice in Learning the Standard Table Tennis Backhand Drive

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Abstract: The purpose of the study was to examine the performance of college students using shadow practice in learning the standard Table Tennis backhand drive. Twelve students from different Physical Education classes were divided into two groups. The Experimental Group was asked to do shadow practice in combination with multi-ball practice. The Control Group performed single ball backhand drills for every pair of subjects alternating with multi-ball practice. The two groups were analyzed in three testing stages. The test was conducted on one subject at a time. Each subject was instructed to hit the fed balls to the designated target area at the opposite court (crosscourt) within the optimal height. The number of balls that hit the specified target area and cleared the optimum height marker was counted and became the subject's score. First, the pre-test, which was conducted after being given instructions on how the backhand drive is done. Second, a post-test was done after the sixth day of continuous training. And finally, the retention test was given after three calendar days after the post-test. There was a significant improvement of the mean and standard deviation scores from the pre-test to post-test in both the Experimental and Control Groups. The Experimental Group went from a mean score of 67.2 ± 17.8 to 81 ± 10.37 while the Control Group went from 64.57 ± 20.59 to 81 ± 14.25. Both groups were able to retain their mean scores in the retention test (83.6 ± 13.01 for the Experimental Group and 78.9 ± 10.88 for the Control Group). Although the mean score of the Experimental Group was higher, there were no significant differences in the scores from the Post to the Retention tests of both groups ($p > 0.05$). The study revealed that both the Experimental Group and Control Group had a significant change in their scores in the post-test phase of testing. Both Experimental Group and Control Group were able to retain their scores.

Keywords: Backhand Drive, Learning, Block Practice

1. INTRODUCTION

Shadow exercise, also known as shadow practice or shadow play, is described as a repetitive action mimicking a specific skill used in a particular sport.

Shadow play is an effective technique used to learn the proper form needed for the correct execution of a skill by using repetitive action (Letts, 2007). It is not only useful in table tennis but also in other field of sports because it develops a player's consistency in producing a standard skill like a proper bat swing, judo throw, bench press, etc. Gold Medalist Olympian wrestler, Ken Chertow, used this drill to develop speed and conditioning as well as improve the retention and confidence of his wrestling techniques (Chertow, 2008). Larry Hodges mentioned in his Instructor's Guide that physical training is important in table tennis (Hodges, 1989); shadow play can be a great work out and can improve the techniques of a table tennis player. According to the Royal Navy website, a table tennis player must have a total control over the ball (Royal Navy, 1999). Shadow play can help the player in conditioning his/her muscles on the correct position of the racket and correct form of how it feels like.

In table tennis, shadow play is when a player practices his stroke technique without the ball. It is like a form of role playing wherein the stroke is played just as it would in a normal rally. The absence of the ball allows the player to concentrate on getting his technique correct, and what the correct technique feels like. Shadow play can be a valuable training tool if done with proper attention to form (Letts, 2007). Furthermore, the exercise will benefit players of all levels, but most especially beginners. In the researcher's informal interview of a table tennis team in large Metro Manila University, varsity players reported a refinement of their strokes after shadow play and have since incorporated this exercise in their training.

The basic strokes used in Table Tennis executed using either the forehand or the backhand are drive, topspin, smash, push and flick (Tepper, 2005). This study focused on the effectiveness of shadow play on the backhand drive as it is an important skill to learn. As Hodges (1993) stated, that a well developed

backhand balances a good forehand in covering the table during play. Points can be easily scored if the ball is given to the backhand side of an opponent with a weak backhand drive skill. On the other hand, a powerful attack from the backhand side is the least an opponent can expect.

The backhand drive is a very useful technique in Table Tennis. It can complement the forehand by making backhand attacks more powerful and could also compensate for players who have slower footwork. Although the forehand drive is a more complicated skill than the backhand drive, we cannot discount the benefits of having a powerful backhand drive. It can be used to set-up for a more powerful attack or, it could be the actual attack itself. The backhand drive is very useful in game play and would enhance a Table Tennis player's attack arsenal.

As a point of reference, it should be noted that the forehand drive requires a longer range of muscle movement as compared to the backhand. The initial position of the arm is extended and weight shifted to the racket arm. In executing the forehand drive, the arm swings simultaneous to the weight shift to the other leg while twisting the waist. In the backhand drive, the initial position of the arm is flexed at the elbow and weight is centered. The skill is executed by extending the arm while simultaneously doing a minor weight shift from the support leg to the dominant leg with little or no waist movement. Thus, the execution of the backhand drive is simpler than that of the forehand drive (Royal Navy, 1999).

Florendo and Bercades (2007) examined the effects of shadow practice in learning the forehand drive. Thirty-two subjects (N = 32) were randomly assigned to either an Experimental or a Control Group. The Experimental Group (N = 16) performed shadow practice while waiting for their turn to practice with multi-balls. The Control Group (N = 16) practiced with a single ball for each pair while waiting for their turn to practice with multi-balls. The consistency and accuracy skills test was used to determine the participant's pre-test, post-test and retention test scores. Data analysis revealed that both groups showed a significant change in the scores for the pre-test to the post-test ($p < 0.05$). However, only the Experimental Group was able to retain their scores in the retention test. The authors concluded that using shadow practice is a mode for effective skill instruction. Florendo recommended that a study be conducted to ascertain if the same technique is effective for learning a different skill (Florendo, 2003, p. 15).

The main purpose of the present study was to see the performance of college students in the commonly used consistency and accuracy skills test using shadow practice in learning the standard backhand drive. This in turn, will allow us to observe the effectiveness of shadow practice. The present study specifically aimed to see the performances between two different conditions; using shadow practice in combination with multi-ball practice and using one ball per pair of students in combination with multi-ball practice which were the same methods used by Florendo and Bercades (2007).

2. METHODOLOGY

Subjects

Subjects were twelve volunteer students from a large University located in Quezon City who were enrolled in different Physical Education classes; specifically a Physical Education 1 lecture class, a Basketball, Judo, Bowling and Swimming class. All subjects were those considered pure beginners in table tennis. Students enrolled in Table Tennis were purposely excluded. Those who ever held a table tennis racket or played racket sports were also excluded from the study. Data collection was done during the Summer Session, hence the low number of subjects.

Originally, there were thirteen participants who volunteered for the study. The group was composed of eleven females and two males. Ideally, both groups should have had an equal number of subjects because they were trained in pairs. However, due to scheduling issues and backing out of participants in the Experimental Group, an unequal distribution was effected. The Experimental Group members decreased because one of the female participants was not able to attend the post-test which forfeited her participation in the study. Among the group, there were two subjects who were left-handed and ten subjects who were right-handed. The subjects were mainly females due to the exposure of the majority of males to recreational table tennis.

The subjects were divided into two groups: an Experimental (N = 5) and a Control (N = 7).). The Experimental Group (E) used shadow practice in combination with multi-ball practice; and the Control Group (C) practiced with one ball per pair of students in combination with multi-ball practice.

Procedure

The Table Tennis table was modified by attaching a string to the vertically extended net posts. The string was placed directly above and parallel to the net with a height of fourteen inches. This modification was done to serve as a guide for the subject to make sure that the ball clears the net within optimal height (see Figure 1).

String

Extended post
Target to feed
Net and post

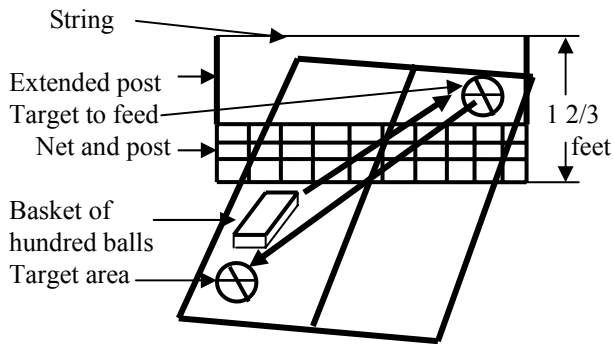Basket of
hundred balls
Target area

1 2/3
feet

Figure 1 Research Instrument (Right-handed subject)

A total of 100 trainer balls were used for the multi-ball practice session. Two persons, a ball feeder and a stroke-counter, administered the test. A metronome was set to 60 beats per minute to be used as a guide for the ball feeder.

The test was conducted on one subject at a time. Each subject was instructed to hit the fed balls to the designated target area at the opposite court (crosscourt) within the optimal height. The number of balls that hit the specified target area and cleared the optimum height marker was counted and became the subject's score. There was a slight modification for left-handed subjects (see Figure 2), but the task remained essentially the same.

The consistency and accuracy of the subjects in executing the backhand drive were tested during the pre, post and retention tests.
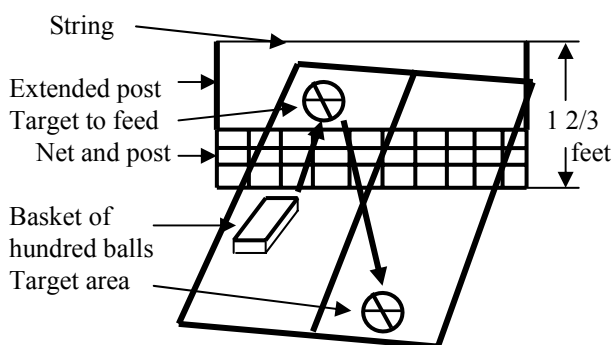
String

Extended post
Target to feed
Net and post

Basket of
hundred balls
Target area

1 2/3
feet

Figure 2   Research Instrument (Left-handed subject)
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The task was to perform the standard backhand drive. The instructions were as follows: Preparatory phase: arm should be relaxed; the racket angle should be approximately 90º and the wrist should be loose. Execution phase: bring racket straight toward the waist then extend elbow forward; contact should be made in

front of the body, then follow through (Hodges, 1993). All subjects were also advised to, "always contact the ball as low to the table as possible, within six inches of it. That way, it won't bounce as high on the far side. It will also make it easier to serve short" (Hodges, 1993).

Immediately after the initial briefing, the subjects were given the Pre-test to establish the baseline data. The participants were randomly assigned to practice conditions after the pre-testing phase, the Experimental Group used shadow practice, in combination with multi-ball practice while the Control Group practiced by performing backhand strokes in combination with multi-ball practice.

In the practice sessions, each one of the twelve subjects practiced multi-ball drills, wherein the ball feeder fed separate balls for each stroke instead of using only one ball (Letts, 2008).

The subjects of the Control Group were instructed to strike the ball diagonally and try to keep their movement in a "controlled" manner and were not allowed to smash the ball even after gaining some ball control over their strokes in the course of the five- day treatment period.

The Experimental Group was asked by the instructor to perform shadow practice of the backhand drive and were allotted five minutes to continuously perform the exercise (Florendo and Bercades, 2007). The first set was done before the multi-ball practice session and the second set of shadow practice was done afterwards.

Following the five-day treatment period, the subjects were subjected to a Post- test. They followed the same procedure as the Pre-test.

After the post test, the subjects were given a three-day rest period then was given the Retention test which followed the procedures done during the pre and post tests. The number of balls to hit the specified target area will be the subject's Retention test score.

Data Analysis

Data was analyzed using the *t*-test to determine significant changes in the two groups' pre-test, post test and retention test. Independent sampling was used to determine significant difference between the two subject groups' post and retention test. Whereas, paired sampling was used to determine the pre-test and post-test, as well as post and retention test between both subject groups. The level of significance was set at $p = 0.05$.

3. RESULTS AND DISCUSSION

Table 1 shows the mean scores between the pre-test and post-test of the Experimental Group which were significantly different. It shows that there is no significant difference between the mean scores in the post and retention test. The findings suggest that the beneficial effects of using shadow practice are not temporary in nature but can positively affect the learning of the standard backhand drive

Table 1   The Experimental Group Backhand Skill Test Scores

	Mean score	Standard deviation	t	Sig. (2-tailed)
Pre-test	67.2	17.8		
Post test	81	10.37	-3.82	0.02
Retention test	83.6	13.01	-1.05	0.35

Table 2   shows the mean scores of the pre-test and post-test of the Control Group. The Control Group played with a single ball as they waited for their turn to practice with multiple balls. They were able to improve their performance even if they spent some of the time picking up the ball rather than keeping it in play. The multi-ball practice session greatly helped them in developing a certain level of automaticity because it involved consistent stimulus-response mapping "where the stimulus pattern always calls for the same response" (Schmidt, 2004). The Control Group was also able to achieve high scores in their post-test.   The Control Group scored lower in the retention test as compared to the Experimental but the difference between the scores from the post-test to the retention test was not significant (see Table 3).

Table 2   The Control Group Backhand Skill Test Scores

	Mean score	Standard deviation	t	Sig. (2-tailed)
Pre-test	64.57	20.59		
Post test	81	14.25	-2.80	0.031
Retention test	78.86	10.88	0.74	0.49

Table 3 shows that there are no significant differences between the Experimental Group and Control Group in their pre-test, post-test   and retention test scores (p > 0.05).

Table 3   Independent samples t-test

	t	Sig. (2-tailed)
Pre-test	0.23	0.82
Post test	0	1
Retention test	0.69	0.51

In this study, both groups were able to execute the backhand drive effectively as early as the pre-test as compared to Florendo and Bercades (2007). Their [Florendo and Bercades] mean scores on the Forehand Drive Pre-test for the Control Group was 37.3 ± 14.99 and for the Experimental Group was 36.8 ± 16.37 while this study shows a mean score of 67.2 ± 17.8 for the Experimental Group and 64.57 ± 20.59 for the Control Group.   Even with the factor of a string that has been used in the current study, the subjects still obtained higher scores as compared to the study done by Florendo and Bercades (2007) which did not make use of a string. The comparison of the results show that the backhand drive is simpler to execute than the forehand (Royal Navy, 1999) as evidenced by the high scores obtained by both groups (Control and Experimental) in the current study, considering them pure beginners in the skill during the pre-test.

The Experimental Group performed better than the Control Group as the retention test mean scores show 83.6 ± 13.01 and 78.86 ± 10.88 respectively which were consistent with Florendo and Bercades (2007) score of 83.4 ± 10.40 and 78.3 ± 12.42 for the Experimental and the Control respectively. In the current study, there were no significant differences (p > 0.05) from the post-test to the retention test for both groups (Experimental and Control) which means that both groups were able to retain their scores. This means that for this study, both shadow practice and single-ball practice combined with multi-ball practice can help beginning level players learn the consistent and accurate backhand drive.

4. Conclusion and Recommendations

A total of twelve Diliman volunteer students with a mean age of 18.33 ± 1.99 were used as subjects of this study. All were considered pure beginners in the sport of table tennis. Pre-test results for the Control Group were 64.57 ± 20.59 and 67.2 ± 17.80 for the Experimental Group. This means that both groups started equally and results indicated that they had performed at a high level. They were asked to report for five days of treatment after which a post-test wherein the Experimental Group achieved a mean score of 81 ± 10.37, was administered after three days from the

post-testing phrase.

The study revealed that both the Experimental Group and Control Group had a significant change in their scores in the post-test phase of testing. Both Experimental Group and Control Group were able to retain their scores (83.6 ± 13.01 and 78.86 ± 10.88 respectively, $p > 0.05$ for both groups). The result of this study contradicted those of Florendo and Bercades (2007) wherein only the Experimental Group was able to retain their scores. For this study, both shadow practice and single-ball practice combined with multi-ball practice can help beginning level players learn the consistent and accurate backhand drive. This proves that shadow practice does improve the backhand drive skill of beginners; hence, an effective method for skill instruction.

For further studies on the subject, it is recommended that height of the string from the net post extension be reduced to six inches (originally fourteen inches) to have a higher standard. The lower the height of the string, the more difficult it is for the subjects to score a successful shot. Also, in practical application to the sport, the closer to the top of the net a drive becomes; the shorter the distance the ball travels therefore, making the shot faster and harder to block.

It is also advised that the study should be done with an equal number of participants. Thirty-two subjects evenly divided into the two groups should be sufficient for this study (Florendo and Bercades, 2007, p. 4).

And finally, since both groups performed multi-ball practice, a comparative study between multi-ball and shadow practice should also be done in future studies to see which one would be a more effective training method.

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APPENDIX

Shadow Group (Experimental)	Gender	Age	Pre-test	Post-test	Retention test
1	F	19	80	91	90
2	F	18	65	82	92
3	F	18	65	78	84
4	F	17	40	65	61
5	F	18	86	89	91

Single-Ball Group (Control)	Gender	Age	Pre-test	Post-test	Retention test
1	M	17	36	85	79
2	F	18	45	55	60
3	M	24	83	95	92
4	F	21	58	80	73
5	F	18	86	93	79
6	F	20	58	70	78
7	F	18	86	89	91

RAW DATA

Testing dates: April 18/25/29, 2008