

Effect of Reinforcement Contingencies on Skill Performance in Badminton

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ABSTRACT

The purpose of this study is to determine the effect of reward and punishment on the skill performance (short serve for accuracy and badminton playing ability) of male badminton players. The subjects for this study were 40 male beginner badminton players randomly selected from School of Physical Education, Devi Ahilya University, Indore in the session 2009-10. The Criterion measures were the scores obtained in French Short Serve Test and Lockhart and McPherson Badminton Wall Volley Test. The findings of this study may add to the existing knowledge regarding the effects of reward and punishment on performance for intercollegiate badminton players and may indicate the type of reward or punishment (verbal or tangible) which are more effective for improving the performance.

Yadav, S. K; Singh, Devesh and Pawar, Ranjeet Singh (2012) Effect of Reinforcement Contingencies on Skill Performance in Badminton *International Journal of Physical Education, Sports and Yogic Sciences* 1(2): 32-35.

Key words: Reward, Punishment, Skill Performance, Reinforcement Contingencies.

Parents, teachers and trainers have since long found that they can direct learning of an organism by rewarding approved conduct and by punishing disapproved one. Evidence from psychological experiments suggests that reward is indeed more effective than punishment. Reward directly strengthens the rewarded behavior while punishment works only indirectly and does not universally weaken the punished behavior.

The purpose of this study is to determine the effect of reward and punishment on the skill performance (short serve for accuracy and badminton playing ability) of male badminton players.

Methodology:

The subjects for this study were 40 male beginner badminton players belonging to the age group of 18 to 25 years, randomly selected from School of Physical Education, Devi Ahilya University, Indore in the session 2009-10. These subjects were randomly assigned to four groups' namely verbal reward, verbal punishment, tangible reward and tangible punishment group. The Criterion measures were the scores obtained in French Short Serve Test and Lockhart and McPherson Badminton Wall Volley Test.

Two skill tests (short serve test for accuracy and badminton wall volley test for playing ability) were administered to all the subjects under each of the experimental treatments viz, verbal reward, tangible reward, verbal punishment and tangible punishment.

Administration of tests and collection of data was done by the investigator with the assistance of one volunteer familiar with the tests. The volunteer's

duties during the experimentation were explained to him by the investigator. To acquaint the subjects with the nature of the tests and to familiarize them with the experimental procedure, demonstration of the tests was given by the investigator.

After demonstration the subject was given the opportunity to familiarize themselves with the tests by taking three trials each just before finally performing the tests. Players belonging to verbal reward group were appraised by the investigator after each turn.

Subjects belonging to tangible reward group were given gifts after each test. Subjects belonging to verbal punishment group were scolded by the investigator in the presence of their teacher. After completing each test the subjects were given verbal punishment. When the subject scored maximum points, he was asked to go ahead with the test.

Subjects of tangible punishment group, before executing the skill were told about the gift for each turn and were also told that if they could not achieve maximum points the gift given to them will be withdrawn after each attempt. After each attempt on the basis of the performance of the subject either the gift was withdrawn or left there. The subjects were allowed to collect their share after completing the test.

The data was collected in four sessions. In every session one particular group consisting of 10 subjects were tested. The scores of the tests were recorded by the investigator and statistically analysed. It was ensured that throughout the testing, subjects do not receive any other aid than the reinforcement given by

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the investigator, which could orient them towards the target.

The results of the t-ratio and ANCOVA applied for the four groups on service accuracy and volleying shuttlecock has been presented in Table-1 to 5.

Results and Discussion:

Table -1: Significance of differences between the pre and post test means of Lockhart and McPherson test

S. No.	Groups	Pre-Test Means	Post Test Means	DM	σ_{DM}	t - ratio
1.	Verbal Reward	54.1	57.4	3.3	1.317	2.51*
2.	Verbal Punishment	54.9	59.9	5	2.852	1.75
3.	Tangible Reward	55.9	60.8	4.9	1.997	2.45*
4.	Tangible	46.3	48.9	2.6	1.416	1.84

* Significant at 0.05 level tab $t_{0.05}(18) = 2.10$

Table-1 reveals that the t-ratio's obtained for the pre to post test means of the verbal punishment and tangible punishment group showed values of 1.75 and 1.84 respectively which were not significant as these values were less than the t-value of 2.10 required for significance. However, t-ratios for the verbal reward and tangible reward group indicated significant values of 2.51 and 2.45 respectively, as these were greater

than the t-value of 2.10 required for significance. This indicates that the verbal reward and tangible reward group was effective for the performance

In order to find out the effect of the four different groups, on serving with accuracy and playing ability using volley performance, the analysis of covariance was applied and the results pertaining to it has been presented in Table-2 and 3.

Table – 2: Analysis of covariance for the four groups on Lockhart and McPherson test

	Group Means				SV	df	SS	MSS	F- ratio
	Verbal Reward	Verbal Punishment	Tangible Reward	Tangible Punishment					
Pre means	54.1	54.9	55.9	46.3	Between	3	579.6	193.2	1.188*
					within	36	5856.8	162.689	
Post means	57.4	59.9	60.8	48.9	Between	3	883.7	294.57	1.607*
					within	36	6617.8	183.813	
Adj. Post	56.19	57.96	57.89	53.01	Between	3	55.14	18.38	0.457*
					within	35	1408.4	40.23	

* Not Significant at 0.05 level

$F_{0.05}(3, 36) = 2.87$

$F_{0.05}(3, 35) = 2.87$

Table-2 of analysis of covariance for the verbal reward, verbal punishment, tangible reward, and tangible punishment on performance reveals F-ratios of 1.188 and 1.607 respectively for the pre test and post test means. Both the F-ratios were not significant

as these were less than the F-ratio of 2.87 required for significance at 0.05 level. The F-ratio for the adjusted final means also indicated no significant value of 0.457 thereby indicating no significant difference in the pre to post means among the groups.

Table – 3: Significance of Differences between Pre and Post Test Means of French Short Serve Test

Sr.	Groups	Pre-Test Means	Post Test Means	DM	σ_{DM}	t - ratio
1.	Verbal Reward	49.5	62.7	13.2	4.203	3.14*
2.	Verbal Punishment	51.7	59.4	7.7	4.256	1.81
3.	Tangible Reward	43.5	59.9	16.4	3.311	4.95*
4.	Tangible Punishment	46.5	51.9	5.4	2.868	1.88

* Significant at 0.05 level tab. $t_{0.05}(18) = 2.10$

Table-3, reveals that the t-ratio's obtained for the pre to post test means of the verbal punishment and tangible punishment group showed values of 1.81 and 1.88 respectively which were not significant as these values were lesser than the t-value of 2.10 required for significance at 0.05 level. However, the t-ratios for the verbal reward and tangible reward group indicated significant values of 3.14 and 4.95

respectively, as they were greater than the t-value of 2.10 required for significance. This indicates that the verbal reward and tangible reward group was effective for the performance of the subjects.

To find the effects of the four different groups, on serving with accuracy and playing ability using volley performance, ANCOVA was applied and the results pertaining to it has been presented in Table-4.

Table – 4: Analysis of covariance for the four groups on French Short Serve Test

	Group Means				SV	df	SS	MSS	F-ratio
	Verbal Reward	Verbal Punishment	Tangible Reward	Tangible Punishment					
Pre means	49.5	51.7	43.5	46.5	Between	3	382.8	127.6	0.91*
					within	36	5029.6	139.71	
Post means	62.7	59.4	59.9	51.9	Between	3	639.7	213.23	1.31*
					within	36	5852.3	162.56	
Adj. Post means	61.7	57.1	62.44	52.67	Between	3	615.46	205.15	1.75*
					within	35	4101.22	117.18	

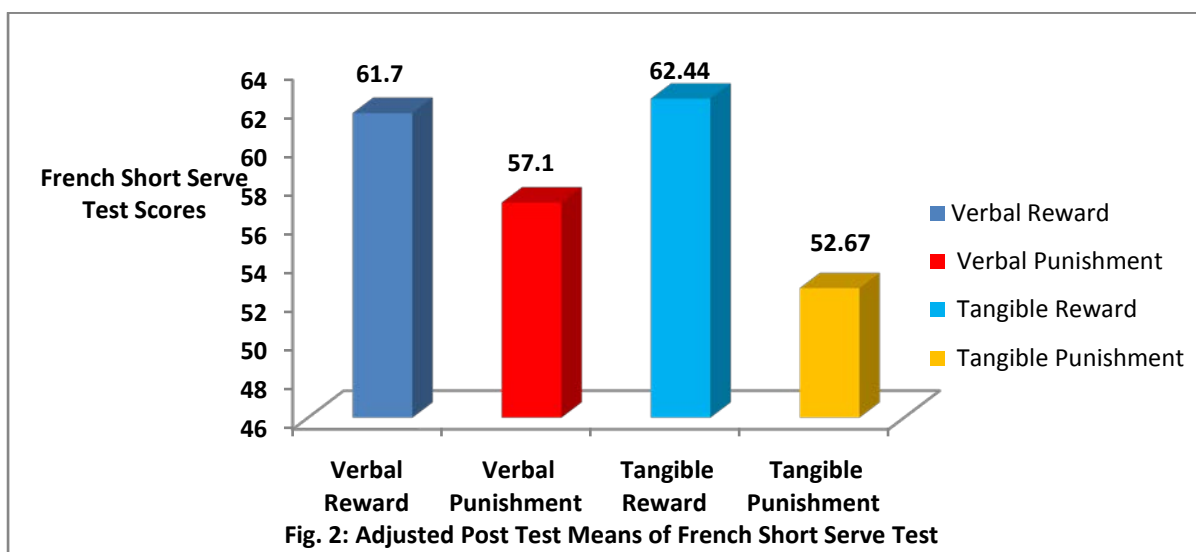
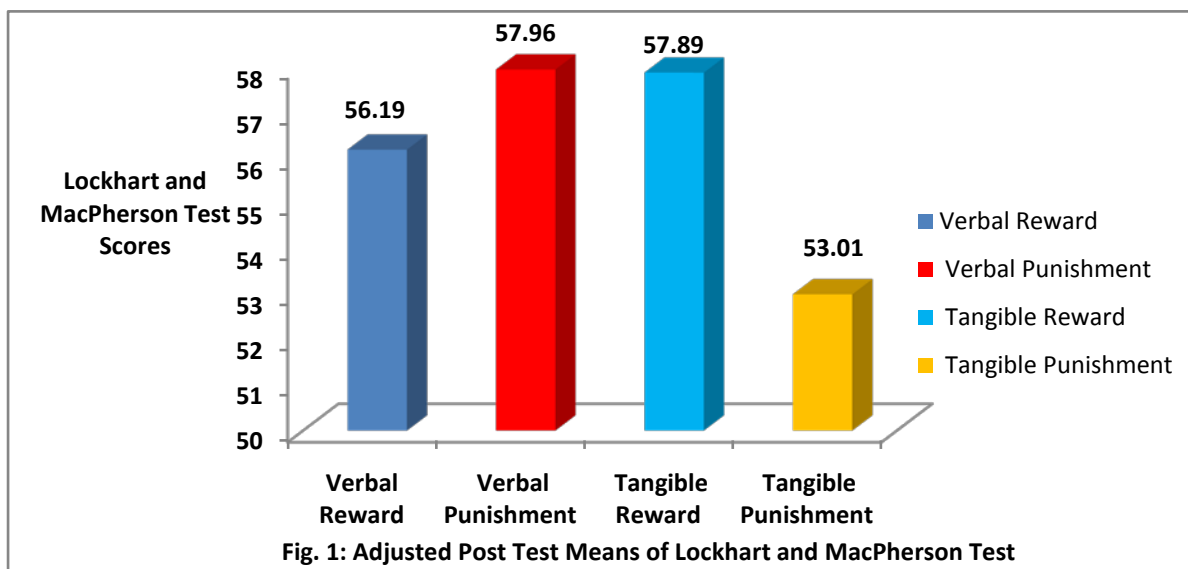
* Not Significant at 0.05 level

$$F_{0.05}(3, 36) = 2.87$$

$$F_{0.05}(3, 35) = 2.87$$

Table - 4 of analysis of covariance for the verbal reward, verbal punishment, tangible reward and tangible punishment on performance reveals F-ratios of 0.91 and 1.31 respectively for the pre and post test means. Both their F-ratios were not significant as

these were less than the F-ratio of 2.87 required for significance at 0.05 level. The F-ratio for the adjusted final means also indicated no significant value of 1.75 thereby indicating no significant difference in the pre to post means among the groups.



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The graphical representation of the paired adjusted final means of the groups of serving the shuttlecock with accuracy and playing ability using volley as shown in the Figure -1 and 2.

Conclusions:

The verbal punishment and tangible punishment group showed values which were not significant as these values were less than the t - value required for significance. The t-ratio's for the verbal reward and tangible reward group on both the tests indicated significant values, as these were greater than the t - value required for the significance.

The verbal reward, verbal punishment, tangible reward, tangible punishment on performance reveals that pre and post - test means were not significant as these were less than the F-ratios required for significance. The F-ratio for the adjusted final means also indicated no significant value indicating no significant differences in both the tests.

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