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EFFECT OF PERCEIVED POSITIVE REINFORCEMENT ON THE SHORT TERM MEMORY OF THE CHILDREN

Saba Sattar
University of Sargodha, Sargodha.
University of Education Lahore, Jauharabad Campus.
RanaYassirHussain (Corresponding Author)
PhD Scholar
Jiangsu University, 301 Xuefu Road, Zhenjiang City,
Jiangsu Province, China.
University of Education, Lahore, Jauaharabad Campus.
Sultan Shujja
University of Management and Technology Lahore.
Muhammad NaveedRiaz
University of Sargodha, Sargodha.

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Abstract: The phenomenon of reinforcement is commonly used for children in all over the world. It is a common practice in our schools and homes to reinforce children, negatively or positively. In Pakistan, teachers and parents using reinforcement are often insensate to the specific effect of that particular type of reinforcement they are using. This study was designed using 3X3 independent group experimental design to examine the impact of reinforcements (chocolate, money, and marks) on short term memory of children. A pictorial recall task was used to test Short-term memory. Children (N=90) were divided into three groups and temptation of three different reinforcements was provided before the application of pictorial recall task. The Inter-rater reliability of the recall task was pleasing. Results exposed that temptation of marks reinforcement had the significant effect on short-term memory than the remaining two reinforcements (money and chocolate). Secondly, short term memory varied across the grade and age. Results have been discussed in specific Pakistani cultural context.

Keywords: Positive reinforcements, short-term memory, cultural context, primary school children, Pakistan

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1.Introduction

No topic is closer to the heart of psychology than learning, a relatively permanent change in behavior due to experience. Learning in all such realms breeds hopes. What is learnable, we can potentially teach, a fact that encourages parents, educators, coaches and animal trainers. Everything which is learned

is stored in our memory, but it differs that whether it stores in long-term, short-term or sensory memory. Memory accuracy was investigated in children and adults. Findings suggest that children were 31% accurate in identifying pictures of animals they had seen earlier as compared to adults whose memory accuracy was only 7% (Murray, 2004). The history of positive reinforcement can be defined as is the presentation of something pleasant or rewarding immediately following a behavior. It makes that behavior more likely to occur in the future. Immediate positive reinforces are more likely to be effective than delayed reinforcing. Therefore the short term consequences of behavior often provide more of an incentive than the long-term consequences (Rathous, 2001).

Reinforcement either positive or negative plays important role in educational settings, social settings and cognitive processes of children, researchers demonstrated that ADHD children were more adaptive and responsive to different schedules of reinforcement than children without ADHD. These results provide evidence for the positive effect of reinforcement in shaping and maintaining adaptive behavior. (DeWitt, Aman, &Rojahn, 2008). Billings et al., (2007) investigated whether positive reinforcement can induce children to incriminate themselves in falsifiable manner. Ninety-nine children were questioned regarding the staged theft of a toy. Half received reinforcement for self-incriminating responses. Reinforced children made 52% false admissions of guilty knowledge concerning the theft within four minutes after receiving reinforcement, and 10% children made false admissions about the theft. Findings indicate that reinforcement can induce children to falsely implicate themselves in wrong doings.

Bear and Sherman (2004) conducted an experimental study to establish the three imitative responses (head nodding, mouthing, and strange verbalizations) in young children by using social reinforcement from a puppet. A fourth imitative response (bar-pressing), which was never reinforced. It was found that increase in strength when reinforcement followed by three imitative responses except bar pressing (non-reinforced response). Jeffrey Felixbrod and O'Leary (2009) conducted a study to compare the effects of contingent reinforcement under conditions of self-determined and externally imposed performance standards. The purpose was to examine the maintenance of self-imposed performance standards over time. Children in one contingent reinforcement condition self-determined their academic performance standards. The same performance standards were externally imposed upon children in a second contingent reinforcement condition who were yoked to subjects in the first condition. Children in a no-reinforcement control condition performed in the

absence of external reward. Behavioral productivity of the self-determination condition was greater than that of the no-reinforcement condition. The existing literature reflected the inevitable influence of reinforcement in different settings, e.g., educational, social and organizations.

1.1.Rationale

There are various researchers who claim that children are more responsive to reinforcement either positive or negative as their cognitive processes begin to work with greater efficiency (Felixbrod and O'Leary, 2009; DeWitt, Aman, &Rojahn, 2008; Billings et al., 2007). Though a lot of work has been done to investigate the effectiveness of positive reinforcement all around the world, but no such effort has been made in investigating the effect of perceived positive reinforcement on Pakistani primary school children. Furthermore, it was empirically observed that teachers and parents use different types of reinforcement across the school and home settings respectively, but without taking care of situational specificity and appropriateness of types of reinforcement in different situation. This study was aimed to cater the understanding about the effect of different perceived positive reinforcements on short term memory of primary school children and whether the short term memory increases across the grades. The combine effect of various perceived positive reinforcement and class on short term memory was also focused. By keeping in view the relevant literature, it was hypothesized that main effect of perceived positive reinforcement and grades, and interaction effects of grades and reinforcement on short term memory of primary school children will remain significant.

2. Method

2.1. Participants

A sample of primary school students (N = 90) was selected from Sanai School System Sargodha city. Students of 3rd, 4th and 5th grades were included in the sample. Their age ranged from 8-11 years (M= 9.5 SD= 2.45). The Stratified random sampling technique was used in order to get a best representative sample. The sample was further divided into 3 groups, i.e. 30 students for each group. Therefore, students were taken from 3rd grade (n = 30), 4th grade (n = 30), and 5th grade (n = 30).

2.2. Apparatus

The experimental apparatus included laptop, reinforcement material, stationery, multimedia and VCD cutter.

2.3. Memory recall task

In order to measure short-term memory, five cartoon pictures were selected to carry equal contents and census was generated through researchers of relevant fields. Children were asked to view the five pictures for 20 seconds (each picture) and asked them to recall contents using the Performa specially prepared to record the responses. Inter-rater reliability of the pictures was satisfactory.

2.4. Procedure

After checking the suitability of picture recall task, an experiment of 3x3 independent group design was designed in the lab setting. Formal permission was sought from the head of Sanai School System, Sargodha and informed consent from the designated sample. Students of three grades (3rd, 4rth and 5th) were assigned into tree experimental conditions (perceived reinforcement of chocolates, perceived reinforcement of money, perceived reinforcement of marks). Each group comprised 30 students of three grades and the experiment was conducted in three sessions. At the beginning of each session, students were instructed about the experiment and its purpose and quarries were satisfactorily answered. In each session, each picture out of five cartoon pictures was presented to the group for the brief period of 20 seconds and the group was engaged in irrelevant discussion for 1 minute in order to avoid rehearsal of pictorial contents. Immediately after the gap of one minute, the group was asked to freely recall the contents of each picture. This procedure was repeated with each picture and with the other two groups. Three groups were tempted to give incentives of three reinforcements (chocolates, money, marks) right after the completion of the experimental session (one reinforcement to one group only). Data was obtained using indigenously developed response form and data was transformed into quantitative scores. All the concerned teachers and students were thanked after the completion of the three-phase experiment. Data were subjected to statistical analyses.

3. Results

In order to measure statistical significance of hypotheses, two way factorial ANOVA and graphical presentation was used

Insert Table 1 Here

The above table showed that main effect of grades {F (2, 89)= 47.047, $p < .001$} and reinforcement {F (2, 89)= 5.10, $p < .01$} while Interaction effect remains non-significant {F (4, 89)= 1.698, $p > .5$}. The post HOC test applied in class and reinforcement revealed that group that was tempted to give marks reinforcement performed significantly better on memory recall task (Mdiff= 49.57) than money (Mdiff= 45.37) and chocolate reinforcements (Mdiff= 45.80) while short term memory recall response varied of in all students of different grades (3rd, 4rth, 5th) and short term memory of 5th grades (Mdiff= 53.33) was greater the 3rd and 4rth graders.

Insert Figure 1 Here

The above Figure is depicting that third graders scored slightly high on the memory task receiving marks reinforcement and but same scores on the memory task receiving money and chocolate reinforcement. Whereas fourth graders scored remarkably high on the memory task receiving marks reinforcement than on money and chocolate reinforcements. Fifth graders scored

high on all types of reinforcements.

4.Discussion

Though the behaviorists have been continuously supporting the impact of reinforcements, positive or negative, on children's behavior and cognition in social, educational and organization setting (Rathous, 2001; (Felixbrod and O'Leary, 2009). This research was focused on the specificity of tempted rather than actual reinforcement's influence on short-term memory of children in Pakistani educational context. Findings revealed that temptation of marks reinforcement had a greater and significant effect on short-term memory of children than a temptation of money and chocolates. The potential explanation of this finding may be twofold: 1) children become more marks oriented because their parents continuously keep on emphasizing achievement of good grades right from the beginning of a child's educational career and a parent's expectations force the children to strive for marks. The temptation of marks led the children to concentrate more on short-term memory task than those children who were given the temptation for money and chocolate reinforcement that, in turn, resulted in enhancement of short-term memory. 2) Teachers appreciate the children who achieve the highest marks or grades within class and other children may get motivated to compete and acquire good marks in the desire to receive appreciation from the teachers. The two explanations seem logical in specific Pakistani cultural context. Another important finding was that short-term memory varies across the grades and age. This finding was consistent with existing literature (Naito and Mika, 1990; Michelene, 1976).

5.Limitations& Suggestions

- In present study just recall task was focused, it is suggested to use recognition task to cross validate the results of this study.

- The sample was limited to first class, private sector education institute, it should be conducted on public sector school, having low socioeconomic status.

- The sample of just school children, in future its results should be tested on institutes of higher education. Like colleges and universities by using different recall tasks.

- The study tests just short term memory, results of reinforcements should be tested on long term memory as in our educational system most of assessment tests are taken on the basis of long term memory.

- In the future research, different types of reinforcement should be used.

6.Implications

-The experiment was conducted on real study settings so, its results are more generalized able than other traditional experimental designs.

-The research confirms the relative importance of the three types of reinforcements in the primary educational system.

- The findings are beneficial for both teachers and parents.

- Gender related issues are much clearly depicted.

- The prominent trends in psychological trends in Pakistan are based on correlation studies in which the association or the prediction of the variables is possible, the current research drawsinfluences which are based on true experimental design.

7.Conclusion

Conclusively, the effect of perceived positive reinforcement on the short-term memory of primary school children was found significant, but marks reinforcement out of three types of reinforcement was more significant within Pakistani primary educational context. Another important finding was that level of short-term memory, increased with the grade and age. This study was conducted in controlled, experimental condition on a limited sample, but this study would prove to be an initiative towards the experimental studies on impact of behavioral strategies for children in Pakistan. The results of this study would be fruitful for parents, teachers and researchers concerning child care.

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Table 1

Two Way Factorial ANOVA Showing Effect of Grades and Percieved Reinforcement on Short-term memory (N = 90)

Variable	*SS*	*df*	*MS*	*F*	*p*
Class	2948.28	2	1474.14	47.04	.000
Reinforcement	320.15	2	160.07	5.10	.01
Class * reinforcement	212.84	4	53.21	1.69	.158
Error	2538.00	81			
Total	204078.00	89			