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By-Berke, Melvyn; Johnson, Edward E.

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Southern Univ. and Agricultural and Mechanical Coll., Baton Rouge, La.

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It was the purpose of this study to ascertain whether the culturally disadvantaged child, who appeared to adhere to the principle of immediate gratification, had learned, as a function of his participation in Head Start, a more future-related orientation when compared to his non-Head Start counterparts. One hundred and eighty-seven 4- and 5-year-olds, divided among three educational conditions, were given a simple learning task with four conditions of reinforcement. The educational conditions were children with 1 to 3 months of Head Start (I), children with 10 to 12 months of Head Start (II), and children with no Head Start (III). The reinforcement conditions were a light flash, a promise of future reward, an immediate reward (candy), and a token that could be cashed in later. In overall performance, groups I and II were significantly superior to III. Specifically, they were superior under the "promise of a future reward" condition. No significant differences were found between the performances of groups I and II. Group III, however, displayed a significant difference in performance under the "promise" and "immediate reward" conditions, in favor of the latter. (WD)

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The Role of Incentives in Discrimination Learning
of Children with Varying Pre-School Experience*

Melvyn Berke and Edward E. Johnson
Southern University, Baton Rouge, Louisiana

The function of incentives in child studies has received much experimental attention. One relatively neglected variable which seems highly significant, and yet has received little attention, is the relationship between incentives and the child's temporal perspective.

Leshen (1952) utilizing an open-ended projective technique, "Tell me a Story," verified the following hypotheses:

- (1) Lower-lower class time orientation is characterized by quick sequences of tension and relief. One does not frustrate oneself for long periods or plan actions with goals far in the future. For these people the future is generally indefinite, vague, and diffuse and its rewards and punishments too uncertain to have sustained motivating value. The principle of immediate gratification predominates.
- (2) In the upper-lower, middle, and lower-upper classes, the temporal perspective is one of longer tension-relief sequences. These people appear better equipped to forego immediate gratification for long-term gains.
- (3) In the upper-upper class the individual tends to conceive of himself as part of a sequence of several or more generations extending from the past.

We would expect these orientations to be reflected in the child's behavior as a function of child-rearing practices. In the upper-upper class we find such child training practices as: "What would your grandmother say?" (Davis, Gardner and Gardner 1941, p. , 98). In the upper-middle middle, and

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upper-lower classes stress is on the future. Children are exhorted to perform well in school by threats that without good grades they will be unable to obtain good jobs or enter college (Hollingshead 1949). In lower-lower class training, techniques are more in terms of immediate reward and punishment. Threat of corporal punishment is frequently invoked, (Davis, Gardner and Davis, 1941: Hollingshead, 1949).

The lower-lower class child appears to experience inconsistency in all areas of his life. Food, shelter, and even personal safety are unpredictable. A vicious circle can be seen permeating the lives of these people. Child-rearing practices are inconsistent. Parents are unable to work for long-range goals, and this in turn impedes their ability to break out of their economic trap. Economic pressures further decrease familial stability. Children who undergo these experiences tend also to emerge unable,, or at best unlikely, to work for long-range goals.

Additional factors are at work in the lives of the lower class child which further punctuate life's inconsistencies. This child plays on the streets without benefit of adult supervision. He is, to a large extent, at the mercy of his own impulses with rewards and punishments following immediately upon his behavior.

Leshan (1952) speculates that an individual raised in an environment where rewards and punishments generally follow immediately upon acts, and where these results are largely unpredictable, tends to develop a low frustration tolerance. Not only will the child forego future gains for immediate gratification, but he also will learn that to work in terms of the

future, which is perceived as a nebulous, unpredictable region, is nonsensical.

Terrell and Kennedy (1957) studied the differential effects of five incentives on the acquisition and transposition of a button-pressing response to the larger of two three-dimensional geometric forms. The incentives utilized were praise, immediate reward (candy), reproof, delayed reward (candy) and a light flash. Their results indicated that pre-school children assigned to the immediate reward condition (candy) learned the concept "larger than" significantly faster than did Ss of all other groups. A surprising finding was that under the delayed incentive condition the younger Ss, ages four and five, learned just as quickly and transposed just as consistently as the older Ss, ages eight and nine.

In a later study Terrell (1958) compared the effectiveness of two types of delayed incentives: promise of future reward, and a token reward which could be cashed in for a real reward, with an immediate incentive in the acquisition and transposition of a button-pressing response to the larger of two three-dimensional geometric forms. Ss utilized were four, five, eight and nine years of age. Analysis of the transposition data yielded non-significant results. With the exception of the nine-year olds, Ss who were given a promise of a future reward required significantly more trials to learn the task at all age levels.

Comparison of the light-only condition in the earlier Terrell (1957) study with the later Terrell (1958) investigation revealed some interesting results. While in the earlier study the control (light-only) Ss required

significantly more trials to learn the concept than did any of the other groups, in the later study these subjects learned as quickly as both the token and immediate reward groups.

Terrell feels these results are a function of the samples utilized. The Ss in the earlier study were drawn from Tallahassee, Florida, while the children in the latter study were from Boulder, Colorado. The principal difference obtaining between these two samples was socio-economic level. It is to be noted that the ratio of rural to urban children was much higher in the Florida sample. There is some empirical evidence to suggest that the crucial variable distinguishing the two samples is a matter of intrinsic motivation (Douvan, 1956). That is, for the Colorado sample, good performance was valued regardless of the incentive offered.

The present study attempted to ascertain whether the culturally disadvantaged child, who appears to adhere to the principle of immediate gratification has learned, as a function of his participation in Head Start, a more future-related orientation as compared with his non-Head Start counterparts.

Based upon previous findings, the following hypotheses were advanced:

- 1) Head Start children will reach criteria under all treatment conditions significantly faster than their non-Head Start counterparts.
- 2) While the Head Start groups will perform best under the immediate reward condition, the differences between treatments will be smaller than those obtained by the non-Head Start group.

- 3) Performance of the non-Head Start children under the token and immediate reward conditions will be superior to their performance under the control (light) and delayed reward condition.
- 4) The non-Head Start group will perform best under the immediate reward condition.

METHOD

Subjects

The investigation utilized 187 children, one-half at the four and one-half at the five-year level. Subjects were drawn from the following three populations: (1) children with 1-3 months Head Start experience (H. S. -I), (2) children with 10-12 months Head Start experience (H. S. -II), (3) children who had never attended a pre-school and who were matched in terms of age, sex, race, and socio-economic status with the Head Start population (N-H. S.). An equal number of boys and girls were tested at each age and treatment level.

Materials

The apparatus was a modification of the one used by Terrell (1958) and consisted of a background and a panel board. The background board is a 16 1/2 x 25 1/2 x 3/4 inch piece of wood with two jacks and two push-button mounts. The buttons are in a line 12 inches apart, 2 inches from the sides and 2 inches from the front edge of the background board. The jacks are in line with the push-button mounts and are 11 1/2 inches in from the front edge. Locked into the rear edge of the background board is a 10 1/2 x 16 3/4 inch panel board which contains the signal light. A standard flashlight bulb was mounted in the center of the panel board 5 1/4 inches in

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from the top. The light is powered by two 1 1/2 volt flashlight batteries. The circuits were arranged so that pushing the button at the base of the larger stimulus caused the light to go on.

The stimuli consisted of four pairs of three-dimensional geometric forms: A triangle, square, circle, and half circle. The smaller member of each stimulus pair has a basal area of eight square inches. The stimulus pairs were presented unmixed in terms of shape and mixed in terms of size. For example, the large and small squares were presented together, but a square and a circle never were presented together. Order of presentation of the stimulus pairs and position of the positive stimulus (large) were randomized. As a further control for the possible influence of order effects, one-half of the subjects received the stimuli in a reversed order.

Design

Four treatment conditions were administered, all of which were rewarded with a light flash subsequent to a correct response. The differential reward conditions for each sub-group were as follows:

- Group I (light only) received only the light flash as their reward.
- Group II (long delay) received a promise of a future reward (candy) following completion of the experiment.
- Group III (immediate reward) received a piece of M & M candy immediately following a correct response.
- Group IV (token group) watched E transfer a dried bean from one jar to another following a correct response. Ss were permitted to cash in their beans for candy at the conclusion of the experimental session.

The criterion of success was nine out of ten successive correct responses. If criterion was not reached the subject was terminated after 100 trials.

The design thus consisted of two levels of chronological age, four treatment conditions, and three levels of pre-school experience.

Procedure

The subjects were individually tested. Each S in each group received the following instructions:

This is a game I want you to try. Choose one of these (E points to the stimuli) and show me which one you have chosen by pressing the button in front of it. If you are right this light (E points to the light) will go on. If you are wrong the light will not go on. Now remember, the game is to see how quickly you can learn to choose the block that makes the light go on.

The last sentence was repeated after every tenth trial. Groups II, III, and IV were given the following additional instructions:

Group II

When we finish playing I will count the number of times you made the light go on. For each time it went on I will give you a piece of candy.

Group III

Each time you make the light go on I will give you a piece of candy.

The child received the reward immediately upon making the correct response. The reward was placed in a clear plastic container within sight of the subject.

Group IV

Each time you make the light go on I will put a bean in this jar. When we finish the game, I will give you a piece of candy for each bean you have in your jar.

In order to insure that Ss were choosing the geometric form rather than the button, for the first four trials, Ss were instructed to point to the form they had chosen prior to pushing the button.

RESULTS

The data were subjected to a factorial analysis of variance (Edwards 1960). The summary for this analysis appears in Table I. A significant F ratio resulted for the levels of pre-school main effect. This result demonstrated a significant overall difference among the three groups (N.-H.S., H.S.-I, H.S.-II) in performance levels. In order to determine the exact nature of this difference a Scheffé test for differences between multiple means was calculated (Edwards 1967). In view of the non-significant F ratios obtained for the age, treatments, and interaction effects these factors were collapsed. The results of this analysis revealed the H.S.-I group to be significantly superior to the N.-H.S. group ($t=3.08$, $t = 3.76$, $p.<.01$) and the H.S.-II group also to be superior in overall performance to their N.-H.S. counterparts ($t=2.47$, $t=3.01$, $p.<.05$). No significant difference was obtained between the overall performance of the two H.S. groups. These results lend partial support to Hypothesis I.

Although the AxB interaction did not reach statistical significance,

inspection of the means suggests the presence of some differences. T tests were computed between the H. S. and N. -H. S. groups performance under each of the four treatment conditions. Since no significant differences were ascertained between the H. S. subjects under each of the four incentive conditions, data for these groups were collapsed, i. e., H. S. -I candy incentive data were combined with H. S. -II candy incentive data. A significant difference ($p < .01$), in favor of the H. S. group under the promise condition, was obtained. While comparison of H. S. and N. -H. S. performance under each of the three remaining treatment conditions favored the H. S. group, the differences did not reach statistical significance. These results also lend partial support to Hypothesis I.

A series of Scheffe tests were calculated among all possible combinations of the N. -H. S. subjects' performance under each of the four treatment conditions, i. e., light vs. promise, light vs token... token vs candy incentive. A significant difference was obtained between the candy and promise conditions ($t=3.37$, $t=3.48$, $p < .05$). This difference favored more rapid learning under the immediate reward condition. While no other treatment combinations reached significance, trends were in general agreement with expectation. Subjects performed best under the immediate-candy, worst under the delay-promise, second best under the control, and next to the worst under the token condition. Identical computations were performed on the H. S. data and no significant differences were found. The above results lend partial support to Hypotheses II, III, and IV. Mean scores to criterion for both the H. S. and N. -H. S. groups appear in Table II.

TABLE I

LEARNING AS A FUNCTION OF LEVELS OF PRE-SCHOOL EXPERIENCE, VARIOUS INCENTIVES, AND AGE

Source	df	Mean Square	<u>F</u>
A (light, promise, token, candy)	3	875.60	2.01
B (N-H. S., H. S. I, H. S. II)	2	3,232.27	7.43*
C (Age)	1	639.45	1.47
AxB	6	578.66	1.33
AxC	3	323.60	
BxC	2	382.20	
AxBxC	6	122.60	
W/T'	<u>163</u>	434.79	
TOTAL	186		

* ($p < .01$)

TABLE II

MEAN TRIALS TO CRITERION UNDER EACH OF
THE FOUR INCENTIVE TREATMENTS

	Light	Promise	Token	Candy
N-H. S.	26.35	44.01	29.10	19.70
H. S. -I	20.69	16.19	17.44	15.63
H. S. -II	17.58	19.25	19.92	15.50
HSI+HS-II	19.14	17.72	18.68	15.57

DISCUSSION

The present investigation attempted to ascertain the existence of a relationship between levels of pre-school experience and performance on a relatively simple learning task as a function of various conditions of reinforcement. It was hypothesized that enrollment in H. S., in which each child presumably experiences a relatively consistent, positive, and supportive environment, would result in the development of a more future-related temporal orientation and thus the ability to delay immediate gratification. Based upon the assumed need of deprived children for immediate and external sources of reward and the decreased incentive value of intrinsic sources of motivation, it was further hypothesized that N.-H. S. Ss would manifest greater variability across treatment conditions. These hypotheses were partially supported.

A most interesting result was the highly significant difference in performance between the N.-H. S. and H. S. subjects under the "promise" condition. While this treatment condition was initially conceptualized along the temporal dimension, i. e., delay of gratification, it can also be thought of as reflecting children's feelings and thoughts regarding the validity, worth, and trust in the word of adults. One five-year-old N.-H. S. child twice inquired if he would have to pay for his candy. His inquiries came just prior to reaching criterion. On both occasions he responded incorrectly on the next trial. This behavior led to a much increased score. Several other N.-H. S. children demanded an immediate pay-off and some

even cried when their reward was withheld until completion of the task.

Although anecdotal accounts are not and should not be considered as scientific evidence, they can be illustrative of such evidence. One may also interpret this treatment condition as representative of other frustrating life experiences. In view of their histories of deprivation it seems reasonable to expect that promises are conceived of as mere verbiage. In effect these children seem to be saying, "Promises, promises that's all I ever get." On the other hand, the H. S. children had little difficulty performing under this incentive condition. These factors are felt to be significantly related to the development of a more future-related temporal orientation. In developing a future time perspective inventory, Heimberg (1963)p. 3) defined future time perspective as "... the degree to which the future is seen as predictable, structured, and controllable..." It seems quite tenable that the development of such conceptions rests upon a basic sense of trust in the words and deeds of significant others in the environment. It would appear that experience in H. S. has altered, at least to some extent, children's conceptions and feelings about the world about them and more specifically their faith and trust in adults. One surprising finding was the lack of a significant difference between the N. - H. S. subjects' performance under the "light" and "token" condition. It was expected that superior performance would be manifested by token-rewarded subjects. As previously stated, analysis of the six possible combinations of the four incentive conditions yielded a significant difference between only the "promise" and "candy" rewarded subjects.

One possible explanation for this result was the nature of the task itself. The task was relatively simple and it is conceivable that utilization of a more complex task would have resulted in greater variability in performance across the four treatment conditions. A further possible explanation for this result may have been the inability of deprived children to use the token as a mediating symbol of things yet to come.

The nature and relative simplicity of the task may also account for the insignificant age and treatment main and inter-action effects. The lack of a significant difference between the two H. S. groups lends inferential support to this hypothesis. If the difficulty level of the task was such that most subjects, in all groups and sub-groups, could master it with relative ease, it is also tenable that what was measured was performance rather than learning. Based upon the present experimental task the evidence indicates that whatever changes occurred in the H. S. subjects took place within the first three months of H. S. pre-school experience.

SUMMARY

Based upon previous findings that deprived children tend to demand immediate gratification and have difficulty in working for long-range objectives, it was hypothesized that the relatively consistent, supportive, nurturing environment of a H. S. program would lead to the development of a more future-related temporal orientation. Subjects were drawn from 3 different populations: (1) children with one-three months H. S. experience,

(2) children with 10-13 months H. S. experience, (3) a matched group who had never attended pre-school. The subjects' task was to learn the concept larger than. Four incentive conditions were utilized: an immediate candy reward, promise of a future reward, a token which could be turned in for candy upon completion of the task, and a control condition in which Ss were informed of their success or failure but received no other intrinsic reward. A significant difference in performance between the three pre-school groups was ascertained. Both H. S. groups were found to be superior in overall performance to their N. -H. S. counterparts. No significant differences were found between the two H. S. groups' overall performance or between their performance under the four incentive conditions. As opposed to the H. S. findings some variability in performance, as a function of the incentive condition, was found for the N. -H. S. Ss.

Comparison of the H. S. and N. -H. S. Ss revealed a highly significant difference between their performances under the promise condition. This difference was in favor of the H. S. children. These results are felt to be related to the development of faith and trust in the word of adults. Recent evidence has also indicated that the development of a future time perspective is contingent upon the perception of the environment as relatively constant and also upon one's ability to predict and to some extent control one's surroundings.

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