

CHANGES IN PEABODY PICTURE VOCABULARY SCORES AS
A FUNCTION OF DIFFERENTIAL FAMILIARITY
AND SOCIAL CLASS MEMBERSHIP

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The present study was designed to investigate the discrepancy in test performance between the upper-middle-class and lower-class kindergarten-age child as a function of differential familiarity with test content. If superior performance by the upper-middle-class children on IQ tests occurs primarily because these children are more familiar with the test content than are the lower-class children, then these performance differences should be reduced when the lower-class children are given an opportunity to become familiar with the test content.

Four conditions were used: (1) an upper-middle-class experimental (UME), (2) an upper-middle-class control (UMC), (3) a lower-class experimental (LE) and (4) a lower-class control (LC). Two scores were obtained on the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1958) for all subjects Ss: One prior to and one following the treatment and control procedures. The difference between these two scores (gain scores) was used as the dependent variable.

An analysis of variance was performed on the gain score data. The results of this analysis indicated that both main effects as well as the interaction between the variables were

significant. Individual t tests were performed between the independent means in order to test the specific hypotheses. As was predicted, the t tests supported the stated hypotheses, namely that (1) the UME Ss had significantly greater gain scores than its control group, (2) the LE group had significantly greater gain scores than its control group and (3) that after introducing a compensatory program based upon the test content, the LE group exhibited significantly greater gain scores than the UME group. These data support the contention that in simple perceptual-discrimination tasks, the performance of disadvantaged children can be improved by providing them with a compensatory program designed to increase their familiarity with the material to be discriminated. Further research concerning compensatory programs was recommended.

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CHANGES IN PEABODY PICTURE VOCABULARY SCORES AS
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Numerous studies have consistently reported the observation that children from the lower socio-economic status (SES) score significantly lower on standard mental ability tests than do children from the upper- and middle socio-economic status (Deutsch, Katz, and Jensen, 1968; Passow, 1970; Williams, 1970). Identifying the causes for this discrepancy in IQ scores between these groups has been an issue of intense controversy among social scientists, school officials, political leaders, spokesmen for minority group parents, and other interested groups.

Eells and his associates (1953) support the contention that differential familiarity with the content of the IQ test items is the primary factor contributing to the consistent differences between the upper and lower SES. According to Eell's explanation, the content typically employed in IQ test items is more familiar to the upper- and middle- status children than to the lower status children. This unequal familiarity with the item content is produced by "differences in the extent to which the child being tested has had the opportunity to know and become familiar with the specific subject matter" (Eells, Davis, Havinghurst, Herrick and Tyler, 1951, p. 58).

Deutsch (1968), like Eells, contends that the child from a disadvantaged environment has missed some of the experiences necessary for developing verbal, conceptual, attentional, and learning skills requisite to school success. These skills play a vital role for the child in his understanding of the language of the school and the teacher, in his adapting to school routine, and in his mastery of such a fundamental subject as reading. It is Deutsch's (1968) thesis that "The lower-class child enters the school situation so poorly prepared to produce what the school demands that initial failure is almost inevitable, and the school experience becomes negatively rather than positively reinforced (p. 87)".

A number of professionals such as Passow (1967) and Coleman (1966) share Deutsch's philosophy. Both of these men argue that the present concept of equal opportunity in education should be redefined. With the exception of Special Education classes for a limited number of students, the present definition of equal consists of providing identical education programs for all students, regardless of differences. Passow and Coleman argue that if a child enters school poorly prepared to cope with existing programs, providing him with identical educational treatment would in fact, mean unequal opportunity. Therefore, these men contend that equality of opportunity can only be achieved by differential treatment. The disadvantaged pupil requires greater, not equal, allocation of educational resources, personnel and materials, in order to compensate for past experiences.

Wilkerson (1970) has pointed out that, presently, compensatory programs appear to be concentrated at the two extremes of the public school spectrum. They exist for the pre-schoolers, such as the Head Start program, and for adolescent high school dropouts who have failed in school and withdrawn. Between these two extremes, there has been little modification of the "regular" school program.

The pre-school studies consistently reveal a pronounced early spurt in intellectual and language development as measured by pre- and posttest measures (Deutsch, 1965). However, follow-up studies demonstrate that the gains in child development resulting from early intervention are quickly lost when the pre-schoolers enter classes in the public schools, especially in the latter grades (Deutsch, 1965; Wolf and Stein, 1966).

Rogolsky (1969) has proposed a more comprehensive program than merely pre-school compensatory programs. She has proposed comprehensive group screening of kindergarten children before entering first grade. This technique would facilitate placement of children into the proper educational program designed to meet the needs of the particular populations within the school. Therefore, compensatory education would become an integral part of the entire school curriculum rather than at the two extremes described by Wilkerson (1970).

The purpose of the present study was to investigate the discrepancy in test performance between the upper-middle-

class and lower-class kindergarten-age child as a function of differential familiarity with test content. If superior performance by the upper-middle-class children on IQ tests occurs primarily because these children are more familiar with the test content than are the lower-class children, then these performance differences should be reduced when the lower-class children are given an opportunity to become familiar with the test content. It was hypothesized that (1) the upper-middle-class experimental group would have significantly greater gain scores than its control group, (2) the lower-class experimental group would have significantly greater gain scores than its control group, and (3) that after introducing a compensatory program, the lower-class experimental group would exhibit significantly greater gain scores than the upper-middle-class experimental group.

Method

Design

Four conditions were used: (1) an upper-middle-class experimental (UME), (2) an upper-middle-class control (UMC), (3) a lower-class experimental (LE) and (4) a lower-class control (LC). Two scores were obtained on the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1958) for all subjects (Ss): One prior to and one following the treatment and control procedures. The difference between these two scores (gain scores) was used as the dependent variable.

Subjects

Seventeen white kindergarten children were assigned to each one of the four conditions. Half of the Ss (34) attended a kindergarten located in an affluent section of a large southwestern city, while the remaining half of the Ss attended a kindergarten in a depressed area of the same city. The children in each respective kindergarten were selected on the basis of their family incomes and their father's or mother's occupations. The median family income for those children designated as lower status was \$4,200, while the median family income for the upper-middle status children was \$12,600. The parent's occupations for the lower status Ss were unskilled or semi-skilled, and could be considered the "blue collar" occupations. In the upper-middle status, the parent's occupations were professional or skilled and could be described as the "white collar" occupations. The Ss in each of the four groups were approximately equal with regard to age and to the distribution of boys and girls.

Material

Form A of the PPVT was used as a pre- and posttest to obtain IQ scores for each S. This test involves visually presenting a page or frame, divided into quadrants with a picture in each quadrant, to the S. Then the S is orally presented with a stimulus word indicative of one of the four pictures. The S is requested to indicate by pointing, which picture represents the stimulus word.

Two hundred 8 x 10½ inch colored drawings were constructed, duplicating the visual stimuli in Frames 25 through 75 of the PPVT. The twenty-fifth frame represents the lowest basal score among the 68 Ss; the seventy-fifth frame, excluding errors, represents an IQ score of 145. This is approximately thirty points above the highest IQ score obtained by a S. This technique was designed to prevent an artificial ceiling from occurring in the UME group. As no S in the UME group approached this IQ score on the posttest, it was assumed that this criterion was met. These drawings were presented to both experimental groups.

An identical number of pictures were selected for the control treatment. These pictures, cut out of magazines and children's books, were mounted on 9 x 12 inch construction paper. These stimuli either involved animal scenes or scenes depicting human interactions such as children engaged in various games and activities. None of these pictures replicated the material from the PPVT. These neutral stimuli were presented to both control groups.

Procedure

Prior to the presentation of the experimental and control treatments, the PPVT was administered individually to each of the Ss. The standardized procedure for administering the PPVT was adhered to with the exception of one variation. The initial oral presentation of a stimulus word for a particular frame was the test response specified by Form A of the PPVT,

and was so scored. Following this initial test response, the subject was presented with a second stimulus word for the same frame, and directed to point to the picture which represented this stimulus word. This procedure was repeated for a third and fourth stimulus word such that the S was asked to make four separate responses per frame instead of the usual one test response.

Although each of the Ss was requested to make three additional perceptual-discriminations for each frame, the scoring procedure remained consistent with the standardized instructions set up by Dunn (1958). All basals, ceilings, and raw scores were based upon the stimulus words specified by Form A of the PPVT exclusively. The technique of having the S make the three additional responses was devised as a control measure. During the experimental phase, it was desired that the Ss be equally attentive to all of the drawings incurred during the pretest rather than selecting out and differentially attending to the test items specified by Form A. The emphasis during the treatment condition was the perceptual-discrimination of all the items, and not the discrimination and labeling of the test items per se.

Although the data collected for the upper-middle-class Ss and the lower-class Ss occurred three weeks apart, the standard procedure for testing the Ss and executing the treatment and control conditions were strictly adhered to at each of the two kindergartens. Two consecutive school days were

set aside for administering the pretest. At the conclusion of the pretest, the experimental conditions were put into effect for five consecutive school days (i. e. Monday through Friday).

The 200 drawings for the treatment condition were divided into four Blocks; each of the four Blocks consisted of fifty randomly selected drawings. An identical procedure was followed for the control condition; the neutral pictures were divided into four Blocks with each one of the Blocks containing fifty of the neutral stimuli. Each one of the four Blocks in its respective experimental condition was randomly numbered one, two, three, or four. The Block number in each respective experimental condition designated which day that particular Block would be presented to the Ss. A different Block was presented to the appropriate experimental condition on each of a four day period.

On the Monday following the pretest administration, the experimental group was shown the first Block of fifty stimuli from the PPVT. Each of the stimuli was orally identified by a stimulus word as they were presented to the Ss. The children were given the instructions that they could make comments or share information about each drawing as it was displayed. The majority of the Ss chose to guess at the identity of the drawings as they were presented. In all cases, the stimulus word was orally presented with each of the drawings and any incorrect responses were corrected.

Similarly, on the same day, the control group was presented with the first Block of neutral stimuli. Each picture was identified as it was shown; the children were instructed that they could discuss each picture as it was displayed. The presentation of the material took about the same amount of time in each of the conditions.

This same procedure was continued for four consecutive days; a different Block of stimuli was presented on each of the four days to both experimental conditions. On the fifth consecutive day, Friday, all 200 stimuli were randomly presented to the Ss in their respective experimental groups. The procedure for displaying and identifying the stimuli remained the same as in the previous days. A posttest was given to each of the Ss participating in the study on the fifth day following the summary presentation. All of the posttests were administered in one school day.

Results

The means for the pretest, posttest, and gain scores for each of the four conditions are listed in Table 1. An analysis of variance was performed on the gain score data. The purpose of this analysis was to determine the significance of (1) the experimental procedure, (2) class variable, and (3) the interaction between these two variables.

TABLE 1
Means for the Four Experimental Conditions

Group	Pretest	Posttest	Gain Scores
Experimental			
Upper-Middle	96.6	111.3	14.70
Lower	77.8	105.7	27.90
Control			
Upper-Middle	94.7	99.1	4.40
Lower	73.2	77.3	4.10

The results of this analysis are listed in Table 2. As can be seen from Table 2, both the experimental-control main

TABLE 2
Summary of Analysis of Variance

Sources of Variation	Sum of Squares	df	Mean Square	F
Experimental-Control (A)	4930.014	1	4930.014	252.726***
Class (B)	705.308	1	705.308	36.156***
A X B	784.721	1	784.720	40.226***
Error within <u>ss</u>	1248.471	64	19.507	

***p < .001

effect and the class main effect were significant at the .001 level. In addition to these significant main effects, the A X B interaction was also significant at the .001 level.

Individual t tests were performed between the independent means in order to test the specific hypotheses. The results of these t tests are summarized in Table 3. As was

TABLE 3
Summary of t tests on Independent Gain Score Means

Means Compared		Means Differences	<u>t</u>	<u>p</u>
M _{LE**}	M _{UME}	13.24	8.76	.01
M _{UMC}	M _{LC}	.36	.23	.01
M _{UME**}	M _{UMC}	10.23	6.77	.01
M _{LE**}	M _{LC}	23.83	15.78	.01

**p < .01

M_{UME} Upper-Middle Experimental Mean

M_{UMC} Upper-Middle Control Mean

M_{LE} Lower Experimental Mean

M_{LC} Lower Control Mean

predicted, the t tests supported the stated hypotheses, namely, that (1) the UME Ss had significantly greater gain scores than its control group, (2) the LE group had significantly greater gain scores than its control group and (3)

that after introducing a compensatory program based upon the test content, the LE group exhibited significantly greater gain scores than the UME group.

Discussions and Recommendations

These data support the contention that in simple perceptual-discrimination tasks, the performance of disadvantaged children can be improved by providing them with a compensatory program designed to increase their familiarity with the material to be discriminated. This finding raises a number of questions, perhaps the most important being: Precisely what kinds of initial inequalities among the lower-class Ss were offset by the experimental procedure? There are at least two main possibilities.

One possibility is that the compensatory or experimental procedure may have simply given the lower-class Ss more opportunity to become oriented and accustomed to the content, both visually and verbally. In this instance, the visual and verbal content may have been initially unfamiliar to these children. This is basically the contention of Eells and his associates (1951)-- that the words and objects that make up the test content have less familiarity to lower-status children.

As to the second possibility, the Ss may have been familiar with the visual content of the test, but not with the stimulus words or verbal content. It may have been that in

this particular case, the children were initially familiar with the visual stimuli, but lacked the appropriate verbal repertoire needed to associate these particular stimulus words with the correct pictures. The Ss enjoyed responding to the test and would frequently point spontaneously to a picture and verbally describe or name it. It was noted that on several occasions, the Ss would unknowingly name the test-item using a synonym instead of the stimulus word proscribed by Form A of the PPVT. When given the stimulus word, the Ss were often at a loss as to the correct response and would make the comment, "I'll have to guess at this one".

One of the more frequent examples of this behavior occurred in the fiftieth Frame. A number of the Ss pointed out that the visual stimulus in the first quadrant in this Frame was "a bottle of pills", but were unable to discriminate the picture of the "capsule". Frame thirty-five presents another example of this behavior. Some of the Ss made the remark that the picture in the first quadrant of this Frame was "a star that law men wore", but were unable to point to the "badge" when given to the stimulus word.

Although it was observed that this behavior did occur in both the upper-middle and the lower-class Ss, it was noted to be much more pronounced in the lower-class Ss. This observation is consistent with numerous individual reports which point out the shortcomings in the language capabilities of lower-status children (Severson and Guest, 1970). If the

experimental procedure did indeed offset an initial language inequality, further research is needed to answer the question: When dealing with the language of the poverty child, is it essentially a language which is deficient or a language which is different?

This question suggests another line of investigation regarding those Ss who, although seemingly unfamiliar with the stimulus word proscribed by the PPVT, appeared to be familiar with the visual stimuli and offered appropriate alternative verbal descriptions of these stimuli: If the Ss were given the opportunity to respond verbally with an alternative word or phrase, and were given credit for an appropriate response, would there be any significant differences among the Ss who could respond with an alternative and those who could not (1) within the group of lower status Ss, (2) within the group of upper-middle status Ss, and (3) between the lower and upper-middle status Ss. From the observations made while administering the PPVT, it is hypothesized that there would be a significant difference between those Ss in the lower-class group who could respond with alternative verbalizations and those Ss who could not. Another question relevant to this investigation involves any significant differences between the actual pretest score obtained on the PPVT and the proposed alternate test score within each of the groups and between the classes.

According to Vane (1971), the common practice of grouping all disadvantaged children into one category or class, masks differences in socio-economic background that affect the children's school performance. This statement suggests that there may be a significant difference in predictive school performance of those lower-class Ss who could make alternative responses as compared to those Ss who could not and deserves further consideration.

Additional research is needed, aimed at identifying what kinds of inequalities are over-come by the present compensatory procedure. The degree to which the material presented is generalized is suggested as one line of investigation. If familiarization acts primarily to orient and to accustom the lower-class child to a specific type of material, then little generalization to other discrimination exercises would be expected where the content is quite different. Perhaps this is a contributory factor in the observation that gains in child development resulting from early intervention are quickly lost when the pre-schooler enters classes in the public school (Wolf and Stein, 1966). On the other hand, if such familiarization allows the lower-class Ss an opportunity to identify various properties of the stimulus and to practice applying labels, it might be expected that the acquisition of such generally useful skills would promote transfer to other discrimination exercises even though the content would be quite different.

A complex area of research involves the significance of the gain scores. There are several lines of thought in regard to this subject. In the first line of investigation, the gain scores are regarded strictly as an indication of the success of the experimental procedure in strengthening familiarity with the test content and little more. However, the significance of the gain scores as a predictor of the susceptibility of the disadvantaged child to compensatory programs is offered as a second line of investigation. The most controversial line of research involves the predictive value of the gain scores with regard to school performance: Do the gain scores reflect the predictive academic performance of the Ss? A number of reports indicate that, although there is no doubt that many individual children have benefited from compensatory programs, there is no clear-cut evidence that these programs made any substantial differences in the educational performance of the disadvantaged children involved (Wilkerson, 1965).

A 1967 study by the United States Commission on Civil Rights was designed to assess the effects of several large, widely known programs of compensatory education in segregated schools and to compare the educational growth of the children in those schools with that of children from similar backgrounds in desegregated schools. The Commission found that "these (compensatory) programs have not had lasting effects in improving the achievement of the students". (p. 205)

Due to the restricted nature of the experimental procedure in the present study and to the contention of recent reports, it is suggested that the gain scores in this study be considered within the spectrum of the first two lines of thought and not as predictors of future school performance. In this case, it is suggested that the pretest scores would be an adequate predictor of school success for a S regardless of treatment group or social class membership rather than the posttest.

The traditional response to the problem of social-status differences in IQ has been to devise new tests, which, it is hoped, will predict pupil capacity for school performance independent of social-status membership. No matter how legitimate this psychometric aim may be, the fact is that differences in actual school performance among social-class groups will continue to exist. If the improvement of lower-status school performance is a worthwhile objective, then approaches other than the conventional psychometric one are needed. The development of training programs that teach skills necessary to deal successfully with curriculum tasks is one approach to this social problem. It is in this connection that the present study demonstrates that even a limited compensatory program will improve lower-class performance on a discrimination task. As Passow (1967) has stated, the central question that must be answered is: "What are the educationally relevant differences which the lower socio-economic

pupils bring into the classroom and what kinds of varied educational experiences must be provided by the school to accommodate these differences?" (p. 4).

Conclusions and Summary

It has been consistently observed that children from the lower SES score significantly lower on standard mental ability tests predictive of school performance, than do children from the upper-and middle SES (Deutsch, Katz, and Jensen, 1968; Passow, 1970). This observation has been instrumental in the development of various programs designed to improve IQ test performance as well as school performance. A large number of these studies deal with the preschool child. These programs seek through early intervention to provide the developmental experiences that primary socialization normally provides for children from more favorably circumstanced homes. The nature of these programs varies markedly from one another. Some of these programs range from vaguely defined "enrichment" and "ego-strengthening" activities to closely structured academic programs with emphasis in the areas of language arts and quantitative relationships.

Marshall and Bentler (1971) have described a successful enrichment program in which the teacher combined an academic program with freedom of expression and an awareness of self-worth. According to Marshall and Bentler, the academic program consists of "internalized learning" of concepts presented one

at a time, and lasting from two to three weeks, with opportunities for the children to not only see the concept, but, "to say it, hold it, eat it, dance it, act it, paint it, build it, and mold it" (p. 805). Freedom of expression in this study included acceptance of the child as he is, using his life style as an asset, not a liability, and building on what is positive in his culture.

A host of variables have been used with lower-status children designed to improve academic performance. These variables have included field trips into the community, audio-visual aids such as educational TV programs, films, and tape recorders. Role-playing and puppetry have also been incorporated into learning activities as well as the token reinforcement (Wolf, Giles, and Hall, 1968).

A highly structured program was reported by Karnes and Hodgins (1969). This program was specifically designed to compensate for the effects of early deprivation. The principle focus of the daily programs was upon three structured learning periods devoted to the teaching of math concepts, language arts and reading readiness, and social-science using a game format. All of these studies reported significant gain scores during the programs, but there is no follow-up studies indicative of the significance of these gains with regard to predictive school performance.

The present study was designed to investigate the discrepancy in test performance between the upper-middle-class and

lower-class kindergarten-age child as a function of differential familiarity with test content. If superior performance by the upper-middle-class children on IQ tests occurs primarily because these children are more familiar with the test content than are the lower-class children, then these performance differences should be reduced when the lower-class children are given an opportunity to become familiar with the test content.

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