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ABSTRACT

This study begins a systematic examination of the role that content of materials used in experimental free recall tasks, as well as the origin plus the appropriateness of designated "conceptual categories," play in determining mnemonic performance of different groups. It will deliberately engineer the way materials are derived and constructed for recall tasks. This study started by eliciting information on a set of categories generated by those who have been consistently shown to cluster and recall relatively poorly--lower class black high school dropouts. They were compared with white middle class parochial high school students on tasks developed from experiences of similar urban black youth. Prior to conducting the recall study, a group of 75 black adolescents living in and attending school in Central Brooklyn were employed to generate recall materials. Thirty-four black and white adolescents recalled a list of 30 words. There was no significant difference between groups in the amount recalled. Black adolescents clustered more than white adolescents with a high correlation between amount recalled and clustering. Analysis of within list category responses suggests that the "black categories" depressed the categorized recall of white adolescents. The results indicate that cultural origin of materials can alter standard expectations of ethnic group performance. (Author/JM)

Cultural Content of Materials and Ethnic Group Performance in Categorized Recall

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Content of Materials and Ethnicity in Caregorized Recall

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Abstract

Ethnic group differences in categorized recall is explained by levels of ability. This study examines whether such performance can be attributed to the cultural content of materials. Words derived from black students and classification norms comprised the recall materials. Black and white adolescents recalled a list of 30 words. There was no significant difference between groups in the amount recalled. Black adolescents clustered more than white adolescents with a high correlation between amount recalled and clustering. Analysis of within list category responses suggests that the "black categories" depressed the categorized recall of white adolescents. The results indicate that cultural origin of materials can alter standard expectations of ethnic group performances.

In the study of memory, free recall has become a popular measure of mnemonic ability and cognitive development (Appel, Cooper, McCarrell, Sims-Knight, Yussen, and Flavell, 1972). An attractive feature of this free recall procedure is that it allows the individual to employ his own strategy for remembering words presented in a randomized order. If the list consists of recognizable categories, or other bases for intra-list organization, the subject is free to employ clustering as a recall strategy. Taxonomic classification into "conceptual categories" is widely considered to be both a facilitator of memory and a measure of higher order cognitive abilities (Tulving and Donaldson, 1972). A great deal of research has repeatedly demonstrated that older children recall more and show more conceptual clustering than younger children (Cole, Frankel & Sharp, 1971; Mandler & Stephens, 1967; Moely, Olson, Halwes & Flavell, 1969; Neimark, Slotnick & Ulrich, 1972; Vaughan, 1968; among others).

Studies of clustering ability has likewise shown mnemonic performance differences among various socio-economic and ethnic groups that vary as a function of such variables as age and instructions (Glasman, 1968; Jensen & Frederikson, 1973; Shultz, Charness and Berman, 1973). This paradigm is frequently used by Jensen to justify inferences about the differential amount of higher order learning capacities in various populations. However, the assumption that a list is categorizable is predicated on the notion that the subject shares the same "conceptual categories" and same concept exemplars

as those devised by the experimenter. If the subject does not share the experimenter's classification scheme we may erroneously attribute differences in group performance on free recall tasks to process and ability when the differences in performance may be more a function of differences in list structure as it relates to different subjects' lexicons. In effect, groups who do not share the experimenter's (and normative groups') structure and ordering of categorizable items may be placed in the position of learning a partially categorizable or non-categorizable list. Cofer (1968) and others including Jensen have shown that for white populations, recall of a categorizable list is better than recall of a non-categorizable list. Mandler and Stephens (1967), Scribner (1974) and Lange (19) have all shown that if subjects' own categories are used for recall, and if their spontaneously generated categories differ from the accepted norm, they cluster more than we estimate them to on the basis of the norms.

The issue of assessment tasks being contingent upon an appropriate informational base or in other words the "content of experiences" possessed by a person (or group) is in part the argument presented by advocates of "culture-fair or culture specific" tests. An underlying assumption in this test development advocacy is that performance must be considered and ultimately weighted within the experiential context of the specific population of interest, i.e. black or white, male or female, middle class, or lower class, urban or rural, etc. (Williams, 1971; Jones, 1972). Given these assumptions performance of

groups should reflect more of the norm as the content of measuring instruments more and more begin to approximate and build from the background of the study population. The extent to which basic cognitive processes are experientially (or culturally) determined in their manifestations is a subject in need of further research. This study begins a systematic examination of the role that content of materials used in experimental free recall tasks and the origin plus the appropriateness that designated "conceptual categories" contribute to determining mnemonic performance of different groups. It will deliberately engineer the way materials are derived and constructed for recall tasks as part of the research objective. It is expected that this study will not only provide information on the effect that experientially-based recall materials have on performance but also in part clarify our explanation for group differences in mnemonic performance.

In addition, more information is needed to understand the extent to which experiential background of populations defines "conceptual categories" and what constitutes appropriate member items. With added knowledge in this area of cognition we may be better able to differentiate performance differences due to a deficiency in process and/or skill in contrast to deficiencies in information, practice, and/or instruction in the proper learning strategy. Moreover, this becomes an important step toward discovering the impact that task content from pertinent learning environments has on the utilization of mnemonic ability. In support of our assumptions we can reasonably expect that given word lists dev-

eloped from the frame of reference of the sample population, there will be a high incidence of categorized recall. This is perhaps due to familiarity and experiential relativity. Moreover, given the evidence that clustering ability is a skill developed with age, we can further expect that a population of adolescents should readily employ the strategy of categorization as a mnemonic device to facilitate memory.

Therefore, this study started by eliciting information on a set of categories generated by those who have been consistently shown to cluster and recall relatively poorly -- lower class black high school dropouts. They will be compared with white middle class parochial high school students on tasks developed from experiences of similar urban black youth.

Subjects

The subjects in the recall part of this study were 34 adolescents living in the New York Metropolitan area and enrolled in a high school program.

Half of the subjects were black. These subjects attended an alternative high school in Brooklyn set up in conjunction with a regular city school, but designed to accommodate students who were referred because of poor school performance or unacceptable social behavior in the regular school. The income levels of the families of these students would place them in the lower and upper-lower economic levels. Although these subjects were 18 years of age on the average and considered 10th and 11th graders, the actual work assigned to them ranged over the entire normal high school curriculum. The

alternative school itself is quite small, with a total population of about 80 students. Of the 17 black adolescent's employed in the recall study 9 were female and 8 were male.

The remaining half of the stubjects were white. They attended an integrated parochial school located in Manhattan and all were attending the 11th grade. Their average age was 16 years, the age-level considered appropriate for this grade. Their school was quite large (approximately 1800 students), and the family background of the students sampled would be classified as lower middle class. For the 17 white adolescents all were female.

Prior to conducting the recall study, a group of 75 black adolescents living in and attending school in Central Brooklyn were employed to generate recall materials. These subjects were located at regular high schools, other alternative schools and local "neighborhood hangouts."

Materials

The purpose in developing non-standard materials was to construct a word list which in part derived from the experiential background of the black subjects. To accomplish this goal, subjects were given a list of "conceptual categories" that the experimenter believed were a part of the common vernacular for the average urban black adolescent in New York City. A key feature of the list was to try and tap the social domain of the adolescents by emphasizing that street-slang terms should be used where they were appropriate. Examples of categories surveyed are: drugs, slang or street words, soul food, types of dance,

types of women, black leaders, athelotes, types of hustlers, church officials, and magazines. Respondents to the survey were asked: "Name 5 different things that belong in the following categories. Street terms are preferred. Example: Fruit -- apple, orange, peach..." After the instructions, each person filled out their responses on a form with the categories listed. In the selection of categories and words for the recall list, the frequency of naming a member item under a given category was first computed. The categories containing common items provided by a majority of the subjects were earmarked for inclusion in the final task materials.

In addition to the word list of "black categories" the final experimental task included words from three categories (clothing, tools and utensils) which have been widely used on free recall experiments and which derive from standardized category norms (Cole, Frankel and Sharp, 1971; Loess, Brown, and Campbell, 1969; Postman and Keppel, 1970; Shapiro and Palermo, 1970).

The final list was composed of words from two designated content areas: "Black Categories" and "Universal Categories" (See Table I).

Five randomized orders of the basic list were constructed with the sole restriction that no two items from the same category would be adjacent to each other. Each subject was presented a different ordering of the 5 list arrangements on his five trials.

Insert Table I about here

Procedure

Each subject was told that they were participating in a study of memory, that they would be given a list of words to remember in any order they liked, and that the experimenter would go through the list a total of five times. The subjects would verbally recall what they could remember after each trial. The lists of randomized words were presented at an interval of approximately 2 seconds per word. After the experimenter had read the complete list the subject's responses were tape recorded for each trial. Later each subject's performance was transcribed and coded for computer analysis.

Results

The data were analyzed for the number of items recalled and the degree of categorial clustering. A t-test between the male and female results within the black student population was not significant. This eliminated the question of sex differences determining these results.

The average number of items recalled showed a steady increase over the five trials for both black and white students ($F=35.50$, $d.f.=4/128$, $p. < .005$) (See Figure 1). Although the black students consistently recalled more from the third trial on, there was no significant difference in the amount of recall between the two groups. However, there was a significant interaction in the amount recalled between black and white students ($F=4.37$, $d.f.=4/128$, $p. < .005$). Black students demonstrate more consistent and larger gains in the amount recalled per trial than white students.

Analysis for the degree of categorical clustering (using the z-score measure applied by Cole, Sharp, 1971; Jensen and Frederikson, 1973) indicated that black students clustered significantly more overall than white students ($F=9.63$, d.f.$=1/32$, $p < .005$). Figure 2 graphically presents evidence that black students clustered on later trials two to three times as much as the white students. This increased difference between groups on later trials is reflected in a highly significant Groups X Trials Interaction ($F=12.43$, d.f.$=4/128$, $p < .005$).

To further elucidate the utilization of categorical recall as a mnemonic device, correlations between the number correct and amount of clustering were computed for Trial V where performance differences between groups were largest. The data show that black students recalled largely by the use of categories ($r=.95$, $p < .01$) in comparison to white students ($r=.27$, $p < .10$).

Insert Figures 1 and 2 about here

These results suggest that although both black and white students recalled approximately the same amount of words their strategy for recalling differed. It is clearly evident that the black students employed categorical clustering as the mnemonic technique in remembering whereas the white students did not to any great degree. Moreover, the correlations found between the number correct and amount of clustering further confirms the use of categories as the device for

remembering by black students but not the white.

To understand better the nature of the results, it was decided to look at the responses in terms of the two major conceptual categories built into the task; i.e. Black and Universal Categories. Responses for each student group on Trial V were again evaluated for the number correct, the amount of clustering and the recall-clustering correlations. But in the analysis, the data are collated by category types.[1] When the data are broken down in this way, the findings for the number correct are consistent with the overall analysis. There is no significant difference in the amount recalled between student groups and categorical conditions.

Insert Table II about here

Likewise, we find that the amount of categorical clustering is consistent with the overall result insofar as black students are using categories for recall at least twice as much as the white students. This is the case for both major conceptual categories established by the experimenter. T-tests between the mean z-scores for black and white students in the Black and Universal Categories is highly significant (Black Categories: $t=4.75$, $d.f.=35$, $p < .01$; Universal Categories: $t=2.13$, $d.f.=35$, $p < .05$). The correlation coefficients for each class of categories give us the first clue as to the source of the performance deficit in the clustering of the white students. Although a relatively small

amount of clustering occurred for white students in the Universal Categories, there was a high relationship between clustering and the amount recalled, indicating a use of categorical recall in this instance. No correlation was evident for the black items. It may be hypothesized that the use of category recall for the Universal items was partially interfered with because of difficulty categorizing the black items. This interpretation is consistent with the comments by subjects during and after testing. On several occasions, the white students would remark that they had "never heard of some words" and/or "could not group them like a few of the others." The seemingly miscellaneous nature of many of the black items for the white students apparently contributed to the overall poor performance in categorized recall.

Discussion

The fact that white students did not sufficiently use categorical clustering as the method for their recall is somewhat inconsistent with expectations. Theory and previous research indicate that by the age of adolescence conceptual ability is more complex, formally organized, and differentiated. Adolescents manifest their cognitive development by greater utilization of categorical clustering as a facilitator of memory in contrast to young children (Cole, Frankel, and Sharp, 1971; Ginsburg and Opper, 1969; Bousfield, 1953). Similarly, Jensen's hypothesis of Level I and Level II mental ability is a distinction between rote learning and memory (Level I) and abstraction and conceptual learning (Level II). Level II learning is developmental and acquired with age. Verbal

recall is an indice of Level II processes, that is verbal recall requires associative clustering in which the subject in order to remember effectively must organize the stimuli into superordinate categories. Therefore, it is reasonable to expect that since Level II ability is developed in older children, adolescents should employ categorical clustering in free recall tasks. The black students' performance is supportive of this expectation, but the white students' is not. They seemingly have utilized a rote memorization strategy which is characteristic of the Level I mental process. What to attribute this result to is difficult. However an explanation for the deficient performance of the white students may rest with the way they approached those parts of the recall tasks which were deliberately derived from the "experiential" frame of reference of the black students. Without consideration given to the derivation of the materials for recall we could interpret the performance of the white students as representative of deficient development in conceptual ability (e.g. Level II processes) for their age. However, further analysis of the white student performance on the experimenter's designated categories presents additional evidence as to the affect "tasks" can have on performance. Moreover, it highlights how results at face value can lead to misinterpretations of the data.

These results support the need for further systematic study into the extent that cultural and social contexts determine human learning and development. Moreover, it suggests that greater attention needs to be paid to the way experiments and instruments of measurement are determined by the cultural and social

contexts in which they are developed. The performance differences among black and white students reveal the influence that content of materials play in behavioral responses. It is reasonable to assume that the categorized recall of white students was inhibited by their inability to recognize suitable categories for many of the items derived from the "black experience." Rote memorization was obviously the technique employed by the white students to achieve the number recalled. Further analysis of the white students performance to determine if they devised idiosyncratic categories different from the experimenter's was unsubstantiated. Using a measure of subjective organization intertrial repetitions (ITRs) refined by Pellegrino (1971) none of the white students developed a unique pattern of grouping the words into what can be construed as a "personalized classification scheme." Moreover, the seemingly non-clusterable black items tended to depress the categorized recall of those Universal items perceived as clusterable. Consequently, a list of words designated as categorizable by the experimenter in effect became to the white students a mixed list of clusterable and non-clusterable words. The resultant performance was a reduction in categorized recall.

The implications of this study are many. It first demonstrates how the content of experimental tasks can alter the expectations of performance in a given population because of the contexts (cultural or social) from which measurement materials are derived. Furthermore, it lends greater credence to the thesis that the manifestation of basic abilities is intricately bound to the contexts

(social or cultural) in which learning and development most often occurs. Therefore, measurement instruments of higher mental processes must be sensitive to and reflective of the ecology of learning for different populations. An additional implication of this study is more a suggestion of approach in research strategy. To gain a better understanding of performance, particularly intellectual performance, it may be more advantageous to focus on the specific population and contextual characteristics which define abilities. Standard normative procedures of establishing general areas of expected competence among diverse groups reveals little about the process and subsequent outcome of learning and maturing in multifaceted social environments. It may be more appropriate for researchers to adopt a "hypothetico-inductive" procedure in the study of human cognitive development with learning environments as the focal point. The identification of commonalities in ability would evolve from the specification and comparison of parallel development among groups with diverse learning ecologies.

Footnotes

[1] To get a measure of clustering on individual categories, the Frankel-Cole (1971) z-score measure was applied in a manner analogous to the way in which this score was applied to the list as a whole. The amount of clustering contributed by a particular category was calculated by computing the z-score with the data coded as a binary sequence with the target category and all other categories forming the two item types. This procedure was repeated for each category on each trial. The results in Table II represent the average z-score for the three categories included in the "black" and "universal" classes.

TABLE 1

Conceptual Categories and Member Items

for Word List

BLACK CATEGORIES

I Drugs	II Types of Dances	III Soul Food
smoke	bump	chicken
coke	latin	greens
ups	grind	corn bread
downs	robot	chitlins
acid	truckin'	ribs

UNIVERSAL CATEGORIES

IV Tools	V Utensils	VI Clothing
drill	spoon	shirt
axe	plate	hat
saw	cup	socks
file	glass	pants
hammer	pan	shoes

Table 11

Trial V, Clustering and Recall-Clustering Correlations

by Sub-Category of Items

	Black Students			White Students		
	$\ddot{x}$ Corr.	$\bar{z}$	r	$\ddot{x}$ Corr.	$\bar{z}$	r
Black Categories	9.94	1.93	.83	8.65	0.36	.08
Universal Categories	9.35	1.50	.89	7.50	0.72	.70

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Figure Captions

Figure 1. Average Number of Correct Responses Per Trial

Figure 2. Average Cluster Z-Scores Per Trial