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ABSTRACT

This summary reports briefly on the progress of KEEP research on cognitive processes, specifically the covert verbal and visual activity of elementary school children. Preliminary research results regarding the infrequent use by children of covert verbal ability, or verbal mediational processes (unless prompted) are discussed. Informal observations also suggest that the study of visual mediational processes is important and related research efforts at KEEP and elsewhere are noted. (SE)

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The Kamehameha Early Education Program

The Kamehameha Early Education Program (KEEP) is a research and development program of The Kamehameha Schools/Bernice P. Bishop Estate. The mission of KEEP is the development, demonstration, and dissemination of methods for improving the education of Hawaiian and Part-Hawaiian children. These activities are conducted at the Ka Na'i Pono Research and Demonstration School, and in public classrooms in cooperation with the State Department of Education. KEEP projects and activities involve many aspects of the educational process, including teacher training, curriculum development, and child motivation, language, and cognition. More detailed descriptions of KEEP's history and operations are presented in Technical Reports #1-4.

ABSTRACT

Cognitive research plans and results are reviewed. Contributions by other researchers are listed. Future research in this area will focus on issues that bear directly on reading acquisition.

Technical Report No. 32

Cognitive Research: Progress and Plans

Ronald Gallimore Roland G. Tharp

The KEEP cognitive research program[1] is the last major effort to be started and has been slowest to develop. The reasons for this are not difficult to understand. Cognitive research is especially time consuming because it entails extremely difficult methodological problems, which require that we be absolutely certain what areas we wish to explore. To develop a set of priorities it was necessary to carry out work in other areas, for example, motivation. Before we could decide what aspects of cognition might be important to study, it was necessary to eliminate those that were being masked by motivation problems. That is, a child not motivated to learn or perform may be mistakenly judged cognitively deficient.

Here we wish to report what work has been done, and to review our conception of the cognitive research that needs to be done. The KEEP

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[1] We approach the study of cognitive in terms of covert visual and verbal mediation. That is, covert responses of a child to external stimuli serve as cues, or self-produced stimuli, to subsequent responses; sometimes this idea is presented as S-r-s-R, with the lower case letters representing covert mediational processes. Since research has usually involved verbal processes, mediation is usually conceived of as covert verbal responses to external events; the covert verbal response serve as stimuli for other responses. The same definition can, however, apply to visual mediation processes. Mediational processes serve to either (1) reduce or select among stimuli, or (2) elaborate stimulus features. Examples of mediational processes include labelling, rehearsal, generalization, associative clustering, verbal self reinforcement, mnemonic elaboration, learning to learning (learning sets), etc.

proposal assumed that a set of cognitive research priorities would be developed late in the initial five-year project, but that execution of these researches could not be completed.

Evidence from the international learning literature suggests that in many instances socially disadvantaged and cultural minority children exhibit mediational abilities equal to more advantaged youngsters. The problem seems to be the reliability with which these processes are activated in disadvantaged and minority children; thus a child may engage in covert rehearsal of material to be learned if prompted by the teacher, then for some reason neglect to do so when learning on his own.

A similar pattern appears at the KEEP school. It is not so much that the children cannot perform certain cognitive functions, but rather that they do not reliably do so. For example, we conducted a study in which children were taught how to label the parts of letter-like stimuli. We had previously found a .70 correlation between ability to label or describe alphabet letters and reading skill progress; a child who could describe a "t" as having a hat was more likely to be doing well in reading. We reasoned that children who could analyze the distinctive features of letters or words would be more likely to learn and remember them later--this hypothesis has substantial support in the learning research literature.

After training one group of children to successfully describe and label letter-like drawings, we later tested them and an untrained

control group on a new set of drawings. There was no difference. To explore the reasons why the training did not generalize, the teacher/experimenter reviewed the teaching materials with the training group and then immediately retested them on the unfamiliar drawings. This time the training group did much better than the control group. Apparently it was necessary for the children to be prompted in order to activate during testing those processes they had used and practiced during training.

A nearly completed Technical Report (No. 31) details an experiment conducted at KEEP which shows that items to be learned are better remembered over two weeks if embedded in a familiar context. The mediational process that is activated is called associative elaboration; in this case, an unfamiliar word is linked to a familiar context thereby facilitating acquisition and recall of the unfamiliar word.

Why the children do not always use the skills they possess is unclear. Dr. Carol Feldman, a psycholinguist from the University of Houston, has been working on related problems. Over the past 18 months we have been in close correspondence with her, and have gained considerable advantage from both her research on older Island children in Ka'u, and her interpretations of our data. She concludes that linguistic facility is an important factor in use of certain cognitive skills and processes. Her research attempts to unravel the effects on cognitive activity of a child's facility in Standard English (SE) versus pidgin (or Hawaiian Islands Creole). While her analyses are

not yet complete, she has suggested that reliable use by young children of certain important cognitive skills may be complexly related to facility in Standard English or pidgin, or both. Her research also suggests that as the pidgin-speaking children progress through school, they learn SE and cognitive-linked school performance differentials are reduced. Dr. Feldman will continue to relate to KEEP. In the future we are hopeful her work will help specify young child cognitive skill difference associated with language code preference and skill.

What we have discussed to this point involves covert verbal activity, or verbal mediational processes. The international literature suggests we need to examine the use by KEEP children of visual mediational processes. That is, while the children may not reliably engage in covert verbal activity during learning sessions, they may be using highly developed visual processes. From informal observations at KEEP it does often appear that the children depend heavily on observational learning. For example, several children had great diffficulty learning to do simple matching to sample problems; after repeated demonstrations by the teacher, they were able to successfully place an X on the item that was different, and circle the two items that were the same. When verbally instructed to place an X on different but not circle similar stimuli on subsequent items, the children became confused and again required repeated modelling of the correct reponse. It is as if the children "took a picture" of how to do the task and could not alter the visually learned procedure through verbal mediation initiated by instructions.

Children who are not facile in SE apparently have difficulty convertly "telling themselves" what to do. They have difficulty translating a task into words, or conceiving of the problem in verbal terms. Thus while they may have normal cognitive processes available, they cannot achieve efficient use of these processes because they do not have an efficient symbol or language system. We can use a computer system as a metaphor: the children have the necessary computer programs (cognitive processes) but lack an efficient computer language (Standard English) to access the programs. In short, it may be easier to think in pidgin about some things, and not others. The same may be true of Standard English.

One important research question which we will address in the near future is what cognitive skills are difficult to activate for children who are linguistically facile in pidgin; in Standard English; and in both. If we can pinpoint differences in young children we may be able to devise teaching procedures to increase the activiation of necessary cognitive processes.

Informal observations of child learning at KEEP suggest that it is indeed true that many of the children who have difficulty learning material involved in verbal instruction and mediation demonstrate rapid learning of skills that may be observed. The potential of research on observation learning has been demonstrated by Dr. Ted Rosenthal and his associates at the University of Arizona. They have shown that minority and other children may rapidly learn conceptual and linguistic rules if they are provided a model displaying the rule-governed behavior in response to some task. Research in this

area is complex and methodologically difficult. Unfortunately, the opportunity to get expert input in this area was lost when the Sociobehavioral Group at UCLA was unable to secure a Postdoctoral Research Fellowship for one of Dr. Rosenthal's students (Dr. John Kelley, now at Vanderbilt University). The plan was for Dr. Kelley to conduct several experiments at KEEP.

A significant line of research related to visual mediational processes has been initiated at KEEP by Drs. Price-Williams (UCLA) and Ciborowski (UH). Their work is directed at the question of what kinds of prompts or cues affect memory. They have compared verbal and visual cues and found that slightly better recognition memory is observed if the child is shown a picture and the experimenter merely labels the picture. Asking the child to also say the label appears to reduce accuracy of later recall. This line of research, supplemented by other work still in the planning stage, will add an important dimension to our cognitive research findings at KEEP.

Drs. Price-Williams and Ormond Hammond have studied Hawaiian child cognitive processes using a kinship classification task. The intent is to use culturally relevant materials and tasks, thus avoiding the ethnocentric bias inherent in conventional cognitive tests.

A dissertation conducted by Dr. William Higa (U.H. Ph.D., 1973) attempted to train children to use covert self-monitoring responses. The purpose was to teach children a cognitive strategy for learning which they could use in a variety of situations. A complete report of this research will be available in the future.

In summary, important cognitive research has been conducted. The bulk of the work remains and will be an unfinished agenda at the end of the initial five years of the project. In the remaining months, concentration will be on cognitive research issues that bear directly on reading acquisition. We will continue our review of the rapidly increasing international literature. The problem of activating available but unused cognitive processes should receive high priority. We will also explore the benefits of increasing the number of overt trials as a method of circumventing the cognitive process activation problem. It is possible that satisfactory learning can be achieved through overt trials for children who might otherwise require frequent prompts to activate covert processes. Discovering a method for making cognitive activation more reliable will be a lengthly and costly task, perhaps beyond the resources currently available.