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ABSTRACT

This investigation was designed to assess the effects of parent influences on the question-asking skills of their children. A total of 43 randomly selected, first grade, Mexican-American children were chosen as subjects and divided equally into a control and an experimental group. In each group the children were further subdivided into two groups in which either pre- and posttreatment measurement was conducted or only posttreatment measurement. In the pretreatment group baseline data was taken on each subject's question-asking ability. Instruction and modeling in question-asking techniques were then given and followed by another assessment of the subject's ability. In the next phase the mothers of the experimental subjects were trained in five sessions to use skills such as reinforcement, cues, and modeling that would increase their children's question-asking behavior as well as shift their question-asking from the predominant nominal-physical questions to causal questions. The results indicated that: (1) trained parents had a significant effect on the target behavior of asking causal questions; and (2) the experimenter's modeling procedures in the pretreatment condition also had a significant effect on question-asking behavior. Concluding discussion focuses on the importance of home instruction and support for school children and possible potential use of parent skills. (SDH)

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THE EFFECTS OF A PARENT TRAINING PROGRAM ON THE QUESTION-ASKING BEHAVIOR OF MEXICAN-AMERICAN CHILDREN

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THE EFFECTS OF A PARENT TRAINING PROGRAM ON THE QUESTION-ASKING BEHAVIOR OF MEXICAN-AMERICAN CHILDREN

Ronald W. Henderson and Angela B. Garcia[1]

Every human culture provides some system for training children to assume their eventual roles as adults in their society. In societies with simple technologies, provisions for instruction can be uncomplicated, with many adults in the community assuming some responsibility for the enculturation of the child. The child is in regular contact with people who are doing the work of the community, and the child learns the functions which are expected of people in his community by observing the behavior of skilled adults and by imitating their behavior. In societies with limited technology, children also have regular opportunities to observe the kinds of satisfactions, or reinforcing events, which are available to those who perform the work of the community. By an early age the child in such a society has had the opportunity to observe most of the roles functioning within his community, and he soon learns to perform tasks which have a real value to others.

As societies become technologically complex, as Western society has, more and more of the responsibility for child training (education) is given over to specialized professional groups. In technologically based cultures there is a strict separation between work roles and family roles which does not exist in technologically simpler cultures.

This shift in responsibility for education from the family and the community at large to professional educators is consistent with parallel increases in the division of labor in other societal functions, and the reasons for the shift are readily apparent. It would appear to be a common

sense observation that in societies in which the demand for technical competencies is minimal, most of the skills required for full participation in the society may be learned from parents, artisans, and others, through the highly effective learning strategies of observation and imitation. In contrast, it is widely assumed that the skills and attitudes required for participation in our highly technical and ever-changing society cannot be learned in this manner. In spite of wide-spread criticism of the American public educational system, our society places great faith in the efficacy of formal education as a means of providing children with the skills they will need to function effectively as adults. Both our technological triumphs and our social ills are commonly attributed to education.

There is now good reason, however, to believe that we have gone too far in our emphasis upon education conducted in an environment that is functionally isolated from the influences of the family.

Since the home does not generally teach the technical and intellectual skills required in the culture, it has been assumed that the schools do provide an appropriate institution for teaching these skills. This may be generally true, but in making this assumption, educators have overlooked the ways in which the home supports the child's learning of such skills. In recent years a body of research has accumulated to demonstrate that characteristics of the home environment contribute heavily to intellectual performance, as reflected in traditional norm-referenced measures of intellegence and academic achievement. Davé (1963) and Wolf (1964) for example, postulated a set of environmental process variables on the basis of theoretical and empirical literature relating to child learning and development. They found substantial levels of association between the postulated variables

and intellectual performance on measures of school achievement (Davé, 1963) and intelligence (Wolf, 1964). Building on the work of Davé and Wolf, other investigators (Henderson, 1966; Henderson & Merritt, 1968) have demonstrated that such environmental measures are also capable of discriminating sharply between the families of disadvantaged Mexican-American children who perform relatively well or poorly on intellectual measures. Follow-up investigations have demonstrated that environmental measures predict academic achievement rather well over extended periods of time (Henderson, in press). These studies have demonstrated concurrent and predictive relationships for different social and ethnic groups between performance on intellectual measures and environmental measures, suggesting that children's experiences in the home account for a generous share of the variance in those intellectual performance characteristics which are presumed to facilitate learning in the school setting. Further, data from the Coleman Report (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & Tork, 1966) suggest that the home environment contributes more to the variance in school performance than does the quality of the school program.

Research such as that described above, together with other approaches, such as Schoggen's (1971) attempts to identify environmental force units in the homes of children, will probably continue to add to our knowledge of the conditions which facilitate the child's development of intellectual skills. But at best, descriptive and correlational studies can only suggest hypotheses concerning antecedent-consequent relationships between children's experiences in the home environment and their intellectual skill performance. The data, now available, demonstrating relationships between school performance and home experiences suggest a crucial need to isolate and to

attempt to modify selected aspects of the child training practices of parents of disadvantaged children.

In order to produce unambiguous conclusions regarding the effects of parent behavior on child development, we have assumed that applied experimentation should begin by focusing narrowly upon a restricted range of child behavior and determine if the target behavior can be modified by parents who have been trained in the use of procedures for influencing that behavior. The present investigation involved an attempt to influence the production of questions in young Mexican-Americans through the use of social learning principles by the children's mothers. Question-asking behavior was chosen as the focus for this study for both practical and theoretical reasons. This is a behavior of practical interest because in the Tucson Early Education Model (TEEM), developed and disseminated by the Arizona Center for Early Childhood Education, it is assumed that question-asking is an important learning-to-learn skill, and data on the effects of parents' efforts to influence the question-asking behavior of their children would have important implications for the parent involvement component of the TEEM. We have assumed that question-asking is a basic intellectual skill by which a child can elicit information from his environment and teach himself, and that it would therefore be important to determine if parents can facilitate the development of this behavior in their children. From a theoretical point of view, investigators concerned with linguistic and cognitive development have asserted that question-asking is of obvious importance in intellectual life (Cazden, 1970) and that question-asking is central to all problem solving (Blank & Covington, 1965). Suchman (1964) whose efforts to train children in inquiry processes are well known, asserts

that "...a realistic approach to conceptual growth must allow the learner to gather and process data in accordance with his cognitive needs of the moment, and this suggests he should be utilizing some kind of inquiry (p. 68)." Justification for focusing upon this skill is also provided by our informal classroom observations which suggest that the rate of question-asking of lower SES Mexican-American children is low, even within instructional situations designed to elicit questioning, and by Rosenthal and Zimmerman's[2] finding that a much lower rate of question-asking behavior could be elicited from young lower SES Mexican-American children than from middle SES Anglo-American children. These observations are congruent with reported data for other lower SES groups. In early studies of the language development of young children, McCarthy (1930) and Davis (1932) found that question-asking behavior develops at a faster rate for higher socio-economic status children than for children from lower socio-economic status backgrounds, and Martin (1970) observed that "disadvantaged" black children performed at a "lower level" of question-asking than their more "advantaged" white peers. If there is actually a higher frequency of question-asking behavior in the repertoire of middle class populations than in the repertoire of lower SES Mexican-American children, and if the questions of middle-class children are of a higher cognitive order than those of lower SES children, this fact may have implications for understanding the cumulative discrepancy in school performance between middle and lower socio-economic groups, and between more and less successful learners within these groups.

While questions of varied types may play an important role in intellectual functioning and problem solving, some categories of questions are later than others in developing in children's linguistic repertoires, and

probably call for a greater load of information and relationships. Ausubel and Sullivan (1970) indicate that questions which come early in children's development call for the names of objects and persons, while why and how questions develop somewhat later. Piaget (1926), in his study of the language of two six-year-old boys, found a very low incidence of production of questions calling for explanations. Isaacs (cited in Cazden, 1970) was particularly interested in causal inquiry, and classified questions of this type as epistemic questions. Cazden (1970) indicates that "By means of these questions, a disparity between our past experience and some present event becomes for the child (or the scientist) the growing point of his knowledge (p. 213)." Since causal questions appear to be of critical importance to the intellectual growth of young children, there is a need to identify means by which children may be provided with a "set" to ask such questions, and the requisite skills for asking such questions.

While question-asking skills have theoretical and face validity as a class of behaviors within a larger set of educational objectives for the domain of inquiry skills, surprisingly little experimental research has been done on children's question-asking behavior. The emphasis of research on children's question-asking appears to be descriptive and normative in nature, with data coming from records of children's spontaneous speech, studies of induced questions, and studies of the kinds of questions used by children in the course of problem solving (Berlyne, 1970).

Aside from developmental descriptions of children's question-asking, Gall's (1970) review indicates that most research on question-asking has focused on teacher behavior, and that the shaping of student questioning skills has been a neglected area of research. Some work has been concerned

with the relationships between thinking processes and classroom questioning. For example, Gallagher and Clegg (1970) have used The Taxonomy of Educational Objectives: The Cognitive Domain (Bloom et al., 1956) as the basis for constructing a classification system for teachers' questions; and Zimmerman and Bergan (1971) have studied intellectual operations in teacher question-asking, using a set of question categories derived from Guilford's (1967) Structure of the Intellect model. In these and similar investigations there has been no attempt to determine the effect of teacher questioning on children's learning or performance. Torrence (1970) investigated the effects of opportunity to manipulate objects on question-asking in young children and found that the opportunity to manipulate objects facilitated question-asking in six-year-olds. Blank and Covington (1965) found that an auto-instructional program was effective in facilitating question-asking on criterion tests, in promoting participation in class discussions, and that inducing question-asking appeared to facilitate problem-solving on a science achievement test. In one experiment Rosenthal, Zimmerman and Durning (1970) demonstrated that modeling procedures were effective in teaching children to discriminate and produce various question categories, and that the behavior generalized to a new set of stimuli.

In view of the apparent importance of question-asking in the intellectual development of young children, the paucity of research on training in question-asking, and the importance of the home environment in developing and maintaining intellectual behavior, the present investigation was designed to assess the effects of parent influences on the question-asking skills of their young children. It was hypothesized that the subjects whose parents were trained and instructed to model, cue, and reinforce question-asking

in their children would produce more questions in the targeted question-asking category (causal questions) than would control children whose parents were not instructed to use these procedures.

The stimulus materials and procedures described in the previously discussed study by Rosenthal and his associates (Rosenthal et al., 1970) were also employed in assessing the question-asking of the subjects in this study. Since that study indicated that the instructional procedures effectively trained children to ask the desired type of question, it might be supposed that parent training would only give children an advantage over untrained children during the baseline condition and that this advantage would disappear after the instruction in question-asking given during the modeling condition. However, it was hypothesized that the experimental children would attain and maintain a higher level of question-asking throughout the three measurement conditions: baseline, instruction, and generalization.

METHOD

Subjects

Sixty subjects were randomly selected from the first grade population of Mexican-American children in a public school serving an economically disadvantaged area in Tucson, Arizona. Thirty of these subjects were then randomly assigned to an experimental group and thirty to the control group. Since the study used a Solomon four-group design, half of the subjects in each group were then randomly assigned to a pre- and post-treatment measurement condition, and half were assigned to a post-treatment measurement only condition. After attrition, 19 subjects (10 boys and 9 girls) remained in the experimental group, and 24 subjects (12 boys and 12 girls) remained

in the control group. Subjects ranged in age from 5 years, 11 months, 16 days to 7 years, 6 months, 3 days for the experimental group, and 5 years, 11 months, 3 days to 7 years, 7 months, 13 days for the control group.

General Procedures

A Solomon four-group design (Campbell & Stanley, 1963) was used in this study, to make it possible to determine the effects of pre-treatment measurement, and the interactions of pre-treatment measurement with experimental treatment. One half of the control and experimental subjects were randomly assigned to groups who received either both pre- and post-treatment measurement, or post-treatment measurement only. The collection of both pre- and post-data employed three conditions; baseline, experimenter instruction in question-asking, and generalization. The experimenter was an unfamiliar Anglo male.

Pre-treatment included the collection of baseline, instruction and generalization data. During the baseline data collection children receiving pre-treatment met with the experimenter individually for the purpose of assessing their ability to produce questions elicited by a set of stimulus materials. Following rapport-building activities, each subject was told that he and the experimenter would play a game, ant that if the child played the game well, he would get a surprise at the end of the game. At this point the experimenter pointed to a box of sugar-coated cereal which was present in the experimental room. The subject was told that his part in the game would be to ask questions. Instructions were given to assure that the subject understood what a question was without any modeling of question-asking on the part of the experimenter. The subject was then instructed to ask a question about each stimulus card as it was presented.

If a child made a declarative statement about a card he was prompted to ask a question. In instances in which no response at all was given during the first fifteen seconds following the presentation of a stimulus card, a prompt was given. Only one prompt was given per card, and if the subject made no response during a fifteen-second interval following the prompt, the experimenter turned to the next card. A third person sat unobtrusively in the experimental room to code a child's responses, thus freeing the experimenter to devote all of his attention to the child. The child's responses were coded into one of four categories: causal questions, non-causal questions, conversations (i.e., non-question verbalizations), and silence.

During the instruction part of the pre-treatment condition the experimenter provided the subject with instruction in question-asking. In this instruction in question-asking condition, procedures were instituted to set up conditions in which the child's imitative responding to question-asking modeled by the experimenter could be measured. The experimenter indicated that he, the experimenter, would now have a turn at asking questions about the pictures. The subject was told, "You won't have to answer, but just listen carefully to the questions I ask, and later you will have a chance to ask some questions. Okay?" The experimenter then presented the original set of stimulus cards one at a time, in full view of the subject, and asked causal questions about each card. Questions such as the following were modeled: to the picture of a typewriter, "When does the bell on the typewriter ring?", or to the picture of a balloon, "What would happen if you stuck it with a pin?"

Following the modeling procedures in the experimenter instruction condition, the experimenter told the subject, "Okay, now it's <u>your turn</u> to ask

some questions. Now ask me something you want to know about this picture." Procedures during this phase of the imitation condition followed the steps described for the baseline condition discussed above.

During the generalization part of pre-treatment the experimenter introduced a new set of stimulus cards which constituted the unfamiliar stimulus materials.

Upon completion of the twenty-fourth card, each subject was praised for his participation, and was allowed to help himself to the sugar-coated cereal, regardless of the nature of his performance during this session.

Following the collection of pre-treatment data just described, the mothers of children in the experimental group participated in a training program, the broad objectives of which were to provide parents with skills which could be used to increase the frequency of question-asking in their children, and to shift question-asking in the experimental children from the predominant category of nominal-physical questions (e.g., "What is this?", "What color is it?", "What is it made of?") to causal questions (e.g., "Why?" or "How come?"). The training procedures used with the mothers are described in detail elsewhere (Garcia, Hoffman, & Lauritson, 1971). In brief, mothers attended five training sessions in small groups of five or fewer participants. After discussion of the rationale for the experiment in general terms and for the training program in more specific terms, mothers viewed demonstrations and learned to code question-asking behavior in the demonstration setting. They observed role playing in which the experimenter and other staff members modeled parent and child behavior, and then engaged in role playing themselves, alternately taking the role of the child and then the parent in interaction with a member of the staff or another

trainee. Following each training session and before attending the next session, each mother spent at least two ten-minute periods with her child, attempting to apply the procedures learned during training, and recording data on the questions asked by the child. After the initial sessions, mothers were asked to reinforce all questions with praise and attention, but to model only causal questions.

The mothers were paid $1.50 per hour for each training session to offset the expense of a baby sitter or other arrangements necessary to free the mother to attend the training. In instances where mothers had to absent themselves from a training session, makeup training was done in the home of the trainee. Makeup was important because the skills taught in the training sessions were structured sequentially. By the time the five training sessions were completed, each mother had spent at least ten practice sessions with her child.

RESULTS

The results of the analysis of variance are presented in table 1. These results show significance between group effects for the experimental treatment ($F = 11.74$, $df = 1/78$, $p < .01$) and significance within group effects for trials ($F = 16.94$, $df = 1/78$, $p < .01$). No interaction effects were significant. It is especially interesting to note that no significant effects were found for the interaction between treatment groups and the pre- and post-treatment conditions. The main effects indicated that the performance of experimental Ss was significantly higher than the performance of control Ss for each trial; baseline, instruction, and generalization. A summary of the analysis of variance on causal question-asking is presented in table 1.

Insert Table 1 about here

From these results it can be concluded that parents who were given training and who were instructed to use procedures of modeling, cueing, and reinforcement in interaction sessions with their children had a significant effect on the target behavior of asking causal questions. The post-treatment data are presented graphically in figure 1. It should be noted that the parent-child training provided for the experimental group had a marked facilitating effect on question-asking performance for all three trials: baseline, instruction, and generalization.

Insert Figure 1 about here

Scheffé post hoc tests further revealed significant increases in causal question-asking from baseline to instruction for the experimental group ($F = 39.41$, $df = 1/78$, $p < .01$) and for the control group ($F = 46.34$, $df = 1/78$, $p < .01$). Differences from baseline to generalization conditions were also significant for both groups (experimental $F = 34.63$, $df = 1/78$, $p < .01$; control $F = 31.20$, $df = 1/78$, $p < .01$). Therefore, it is apparent that the instruction in question-asking provided through modeling procedures by the experimenter was effective and that the effects of the training generalized to a set of unfamiliar stimulus materials. For both the experimental and control groups the difference between performance in the instruction and generalization conditions was not significant (experimental $F = .15$, $df = 1/78$, p ns; control $F = 1.49$, $df = 1/78$, p ns), indicating that there

was no significant loss in question-asking performance from the instructional to generalization conditions.

DISCUSSION

The results indicated that instruction by an experimenter using modeling procedures had a significant effect on Mexican-American six-year-old's production of causal questions, and that this behavior generalized to new stimuli without significant loss. Although not a direct replication of Rosenthal, Zimmerman and Durning's (1970) work, these results support their findings that modeling procedures provide an effective means of teaching children to produce generalized categories of questions, and thus the present investigation has general implications for the design of strategies for direct instruction in information-seeking skills.

The most striking set of findings was that children whose mothers were trained and instructed to use social learning principles directed toward the modification of their children's question-asking behavior produced significantly more causal questions in each of the three trial conditions (baseline, instruction, and generalization) than children whose parents were not trained and instructed to use these procedures. The implications of these findings for education may be made apparent through an analogy. Consider the baseline measurement as a reflection of a child's school entry behavior on a specific academic skill. Further consider instruction on question-asking provided by the experimenter to be analagous to skill instruction provided by the classroom teacher. The teacher might well assume that the change in performance from baseline to instruction is attributable to her teaching. From figure 1 we can note, however, that the experimental and control samples, drawn from the same population, appear to represent

two different populations, high achievers and low achievers on the specific tasks investigated in this study. The differences here, however, are not attributable to differences in the abilities of the children. Rather, they are attributable to the fact that the experimental group of children received instruction and support at home and the control group did not. This situation may be parallel to the natural circumstance in which children's school performance is facilitated by the efforts of parents or siblings at home; the so-called hidden curriculum in the home.

Considering the data already available which indicates that differences in home environments are highly related to differences in children's intellectual growth, the results of this study indicate that parenting skills relating to the development of intellectual competence can be learned and used effectively by parents who have relatively little formal education. The effectiveness of such parental intervention is clearly evident in the results of this investigation. Anecdotally, it should be noted that the mothers of the so-called "disadvantaged" children in the experimental group for this investigation were highly motivated to participate in the training program once the rationale and purposes became clear to them.

Susan Gray's (1971) report on the longitudinal results of the Early Training Project at the Demonstration Research Center for Early Education, suggests that improved educational programs are necessary but not sufficient conditions for dealing with the problem of progressive retardation in the school performance of disadvantaged children. Gray indicates that "Unless the home circumstances of the child can be changed, the adversive environment which created the original problem will continue to take its toll (p. 13)." The results of the present study indicate that the efforts of

parents to influence a specific set of behaviors in their children can be effective in producing in those children a significant increment of performance, over the results of instruction by outsiders.

Further research should be directed toward the problem of determining how parents may be trained to generalize the social learning principles which they were trained to use for this study to other child behaviors which may facilitate intellectual development. Applied experimentation of a longitudinal nature should also be pursued to identify appropriate procedures to maintain the use of parenting skills for which training may be provided, and to determine the specific and general effects of home intervention over time.

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Footnotes

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2. Personal communication.

Table 1

Summary of Analysis of Variance of Children's Causal Question-Asking

Source	df	MS	F
Between Groups			
Parent Training (A)	1	490.04	11.74*
Experimenter Instruction (B)	1	89.23	2.14
Parent Training x Experimenter Instruction (AB)	1	5.49	.13
Error	39	41.74	0.00
Within Groups			
Trials (C)	2	139.01	16.94*
Parent Training x Trials (AC)	2	.70	.08
Experimenter Instruction x Trials (BC)	2	4.08	.50
Parent Training x Experimenter Instruction x Trials (ABC)	2	11.85	1.44
Error	78	8.21	0.00

*$p < .01$

Figure 1

Trial Means by Groups for Causal Questions