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The Experienced Teacher Fellowship Program at Hofstra University involves the participants in investigating the structure, claims, and methodologies of the natural sciences, mathematics, social sciences, and the psychological findings of Piagetian-oriented cognitive development studies. The Fellows in the program form groups to decide on research topics, some of which have resulted in studies of (1) conservation of quantity in first grade children, (2) the level of moral judgments of children enrolled or not enrolled, in a school of the Ethical Culture Society, and (3) the attitudes of lower-class children and middle-class children toward policemen, fathers, mothers, and teachers. (WD)

ENCOURAGING STUDENT'S RESEARCH ON COGNITIVE DEVELOPMENT

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"Teaching Piagetian Theory a la Piaget"

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The research to be reported on was conducted by students in an Experienced Teacher Fellowship Program at Hofstra. The purpose of the program was the following: we wanted the Fellows to examine the structure, epistemological claims and methodologies of the natural sciences, mathematics and the social sciences, and also to examine those psychological findings that related to the cognitive development of children. In addition our plan was for the Fellows to consider the implications of the above for the purpose of teaching and curriculum construction. Such consideration was not to remain at the passive, verbal or class discussion level. We believed with Piaget that more learning would take place if it was connected with, and obtained through, action.

The psychological findings relating to the cognitive development of children which we urged our Fellows to examine were derived primarily from Piaget and from researchers who have worked out of his or a related framework. The relevance of this framework needs hardly be discussed here as it has been well documented and recently summarized by Kohlberg in the December issue of Child Development. Understanding the theoretical framework was however not sufficient for us. We believed that students would profit from generating hypotheses from such a framework and designing research projects which, when carried out by them, would further help them to understand the issues involved in the methodologies of the social sciences. Hypothesis formation and the process of collecting data to confirm or disconfirm particular hypotheses assumes meaning only

through a personal involvement.

Another of Piaget's concepts which we built into the course was the importance of discussing one's perceptions of the real world, the real world in this case being the course requirement. Students were encouraged to do research in small groups, and projects arose out of several months discussion among members of the group, conferences with the instructor and presentation of the tentative projects to the larger group. Initially the groups formed on the basis of a special research interest. It appears to us that the group projects were indeed of better quality than most individual projects and we think that this was partially due to the group's discussion functioning to correct the often inadequate intuitive notions held by individual members and thus obtaining a "consensual validation."

Most of the discussion sessions were of a "brain-storming" type in order to offer a maximum of encouragement to the student who often has little confidence in his own original ideas. We strove to create an atmosphere where all new, or almost new, ideas were rewarded, no matter how wild, how far out, or how impossible to research. The atmosphere was kept free from evaluations; no ideas were judged superior to others and, last but not least, competition was eliminated by promising all Fellows a grade of B for the course.

The student's background includes several years of teaching in an elementary school, and they are selected on the basis of their background and scores on the Miller Analogies Test. In their first semester,

statistics is taught to them, as is a course in cognitive child development organized along the lines illustrated by the movies[2] you have just seen. Students are encouraged to think about research projects at this time but the project does not have to take final shape until the second semester. Initially we have found that the projects students think about deal with the more concrete issues of the classroom, such as when to teach reading, how to teach reading and whether girls or boys are more intelligent. As the semester progresses their thoughts about projects tend to free themselves from such concrete concerns and become somewhat more theoretical and imaginative. Frequently and following our example they combine their research with a little movie-making, especially when we offer free film and equipment.

I will describe selected projects of the last two years. They are partly derived from Piaget's work and partly from the work of other cognitive theoriests. We have had several studies dealing with conservation. One of these used E. Mermelstein's trick conservation apparatus, which consists of a gallon jar, which can be filled surreptitiously by means of a hose attached to the back of the jar. The hose attachment to the jar is not visible to the child due to a screen which hides all but the front view of the jar. The second experimenter fills the jar from behind the screen through the hose. While the visible experimenter pours one small glass of water into the top of the jar, a clamp is released by the other experimenter behind the screen so that the gallon jar looks as if it were being filled by

the person visible to the child. What is expected here is that those children who are conservers will show surprise at the gallon jar filling with water to the top, although only one glass of water has seemingly been poured into it, and they will say something like, "what is going on here?" Those children who are not conservers are expected to show no surprise. Mermelstein believed the surprise reaction to be a measure of the dissonance occurring in the child and as such would have obviated questioning. A group of students were interested in establishing the reliability of this reaction. They first did the classical liquid conservation experiment with 40 first grade children to determine who conserved and who did not. Then they filmed the same children in individual sessions as each child watched the trick with the gallon jar. They were not able to obtain adequate interobserver agreement as to the type of response of the child. They concluded that verbal questioning was still the more reliable measure of the acquisition of the concept.

In another project students attempted to influence the acquisition of conservation through a series of specially devised games of a sensory-motor type. Two groups of first grade children were tested on a liquid conservation task and on a one-to-one correspondence task and then were divided into conservers and nonconservers. The games which were taught to the nonconservers consisted of the acting out of some of the notions inherent in conservation. For example, in a game called "one-to-one" two rows of children stood facing each other, one row bunched together and the row

opposite spread out. Both rows had eight children each. The rows then reversed the procedure and the question was asked of the participants each time: which row has more children in it? The acting out of one-to-one correspondence appeared easier for the children to handle than the use of chips or pennies as regards the number of correct responses. There was however no significant training effect as a result of playing this or related games.

Other projects have dealt with classification, seriation and the development of language. The book on the moral judgment of the child has been the basis for two projects. A preliminary investigation was undertaken in a group of forty middle-class children between the ages of 6 and 12 who were enrolled in a school of the Ethical Culture Society. Piaget's stories were in some cases adapted to make them more appropriate to American children. One of the purposes of the study was to determine whether children in a school which emphasizes moral development would attain higher levels of moral development than children in schools without such emphasis. Additional variables were age, sex and extent of school attendance. The findings were interesting in so far as stage of moral judgment appeared not to be related to age in this sample. That is to say that the younger children were as likely as the older children to make the more mature moral judgments. Whether or not this is a significant finding has to await the collection of normative data on children in other schools.

A new study was begun this year on the responses of children at public and parochial schools in an attempt to collect normative data. Should the Ethical Culture school children turn out to be indeed on a higher level of moral judgment than other children, an examination of the Ethical Culture curriculum would certainly be in order.

Another and larger study on how children form relational judgements was carried out at several OEO day centers and middle-class nursery schools. The sample consisted of over 200 pre-school subjects, and was reported in greater detail in another session this morning.[1] This study offered a group of students who were unwilling or unable to engage in their own project a structured situation where research experience might be gained.

An example of study which did not arise out of a Piagetian framework followed from the administration of a Caldwell preschool inventory to this group of two-hundred four-year-old children. Students analyzed responses to questions dealing with authority figures on the Caldwell Inventory. Children are asked the following four questions: What is the function of 1.. policeman 2. father 3. mother and 4. teacher. The aim of the analysis was to find how the children perceived each of these authority figures, comparing lower class to middle class children, and boys to girls. Responses to the authority figures were classified into neutral or protective on the one hand, and threatening on the other. Results indicated significant differences between lower class and middle class samples as follows: L. C. children view the policeman and teacher as more threatening

than M. C. children. Significance was at the .001 level. The father was also considered more threatening by the L. C. children than by the middle class children but significant only at the .05 level. No differences between the two samples were found for the mother who was only rarely considered as threatening. Both boys and girls had similar percentages of protective or threatening responses. The teacher, however, was perceived as significantly more threatening by the boys than by the girls in both L. C. and M. C. samples. A total threat score was derived from the responses to individual authority and perhaps is indivative of his relation to this total environment. As expected, L. C. boys led all the other groups with the highest average threat score and M. C. girls are the least threatened. A new group of Fellows is following up on this project. They are doing a cross-sectional study using the same four questions on the function of authority figures. They are also using the "children's democratic scale," devised by Irving Starr. The new study will take in children between Kindergarten and the sixth grade and should offer information, among other things, on the effects of social study teaching on the perceptions of authority figures. We shall soon know whether daily contact with the textbooks' version of the friendly policeman will be influenced by viewing Mayor Daly's policemen in action on television.

Other studies which I won't have time to discuss in detail have dealt with the relation between cognitive style and academic achievement, cognitive style and non-academic behavioral ratings, non-verbal

communication, and self-esteem.

We have not been able to evaluate either the total program or parts of it such as the research course. Criteria for such evaluations are difficult to establish beyond those relating to increased knowledge and understanding as well as more effective teaching. In any case, no pre-testing of students was done and we have therefore relied on informal feedback. Such feedback so far has been most favorable as regards both the program and the research course. With all our good intentions however, there appears to be one danger: the program was considered by the participants to be more stimulating than classroom teaching and many students have not returned to the classroom. Those who have returned appear somewhat dissatisfied. It has been suggested that the program poses the question, "How are you going to keep them down on the farm after they've seen Paree," to which unfortunately we have no answer.

FOOTNOTES

1. a. The Intellectual Development of Babies
   b. Stages of Classification
   c. Conservation Tasks

   All three films produced by the author and Greta Morine, Hayward College, California, and distributed by Forward Looking Films, P. O. Box 46, Kingsbridge Station, New York, New York 10463.

2. "The Relational Judgments of Pre-School Children" by Selma Greenberg and Ruth Formanek (Copies available on request.)