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ABSTRACT

In order to study the appropriateness of different structured classroom settings for children's learning and development, the Columbia Classroom has constructed IRIS (Involvement Ratings in Settings) and PRIN (the Pupil Role Interview). IRIS, a seven dimensional scale of affectivity by non-verbal indices, has been employed in two classrooms for each of three Follow Through programs. PRIN, which codes both the developmental stage and the setting content of children's interview responses, has been used to study 480 children from these same Follow Through and from comparison programs. Results will be interpreted in a framework of questions about the match between a child's effective environment and his developmental status as a learner. (For related documents, see TM 003 068-071.) (Author)

SETTING STRUCTURE, INVOLVEMENT, AND DEVELOPMENTAL STATUS AS LEARNER: ELEMENTS OF THE PROBLEM OF THE MATCH

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THE IMPACT OF BEHAVIORIAL MODIFICATION BASED PROGRAMS VERSUS DEVELOPMENTAL BASED PROGRAMS ON PUPIL ROLE DEVELOPMENT

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This pilot study has two major goals: (1) the construction of a pupil role interview schedule and (2) the use of this interview to measure the influence of different programs in Project Follow Through on pupil role development.

The interview has two parts. The first deals with questions eliciting responses about pupils' real and ideal classroom activities, teachers, classmates, home activities that help them in school, rules and materials in the classroom, and the function of school. The second part of the interview deals with Van den Daele's questions about pupils' occupational, material, and social goals. Throughout this report, Roberts calls the first dependent variable "in-class interview response," and the second variable dependent variable "out-of-class interview response."

The out-of-class interview response represents a person's general, ego-ideal standards for making decisions. Since this response is being generalized across different content areas, Roberts expects that it will be more resistant to change by programs than in-class interview response. On the other hand, in-class interview response is being generalized first to pupils' school goals and then to pupils' general ego-ideal. Therefore, it is expected that programs will influence in-class interview responses more than out-of class interview responses. CCEP includes the two parts of the interview to determine empirically the above assumption and to test the relationship between the two parts of the interview.

During the spring and summer of 1972, CCEP interviewed 480 Follow Through and non-Follow Through comparison third grade pupils in 12 geographic sites. The Pupil Role Interview has been developed collaboratively by CCEP and Leland Van den Daele at the Educational Testing Services and is based on an application of his scheme of the developmental stage of preferential judgment, to the contents of the pupils' school environment. In this paper, Roberts discusses the pupil role interview stage analysis, and in another paper, Nordt discusses the pupil role interview content analysis.

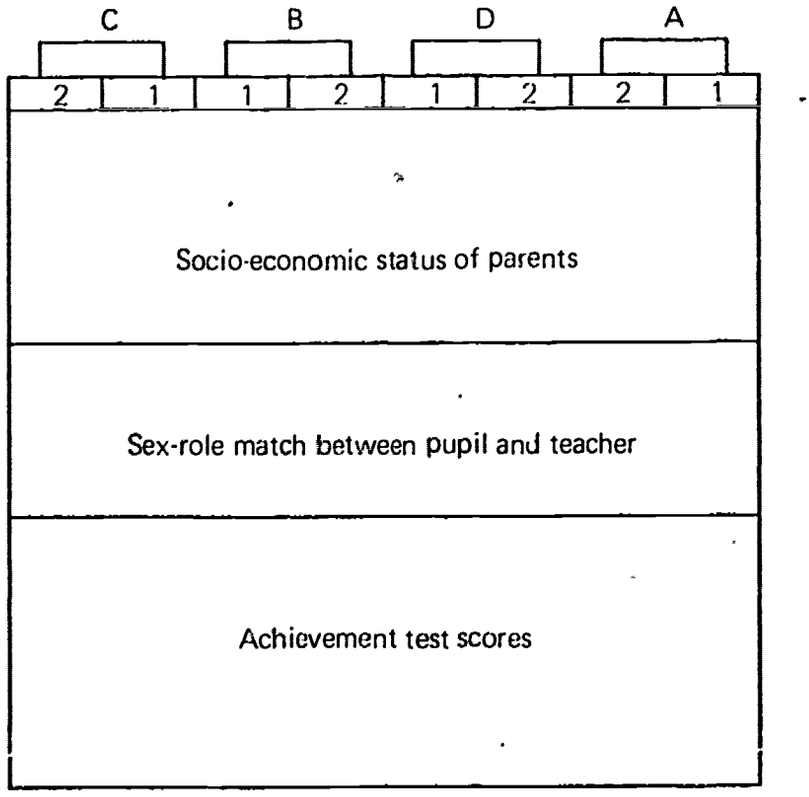
Table 1: SAMPLE SIZES BY SITES WITHIN PROGRAM FOR DEPENDENT VARIABLES: IN AND OUT-OF-CLASS INTERVIEW RESPONSE

Program	Site 1	Site 2
A	39	39
B	40	36
C	38	37
D	40	39

1971-72 RESEARCH DESIGN

Classroom Settings in 8 Follow - Through Sites and 4 Comparison Schools

Pupils' In-Class Interview Responses	Out-of-Class Interview Responses
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12



Appropriate Psychometric Characteristics of the Pupil Role Interview:

(1) Test-retest data reliability adjusted for differences among tests for in-class interview responses is r=.636, and test-retest data reliability adjusted among tests for out-of-class interview response is r=.663.

(2) r=.690 is the reliability adjusted for differences among four raters.

(3) This pilot study has established the invariant sequentiality of stages of both in-class and out-of-class interview response.

THE RESULTS OF ANALYSIS OF VARIANCE, WHERE THE DEPENDENT VARIABLES ARE IN-CLASS AND OUT-OF-CLASS INTERVIEW RESPONSE AND THE INDEPENDENT VARIABLES ARE PROGRAMS AND SITES WITHIN PROGRAM

As is shown in Table 1, CCEP interviewed approximately 40 pupils in each of the eight Project Follow Through sites. Tables 2 and 3 show that there was a between program effect on in-class interview response means at $<.01$ level of significance. It was inappropriate to test for differences

between programs for the out-of-class interview response, since the F ratio for this was not significant. As noted earlier in this report, Roberts expected this differential impact of programs on in and out-of-class interview responses. The remainder of the analysis is meant to clarify the meaning of this first finding.

Table 2: TABLE OF MEANS FOR THE DEPENDENT VARIABLE STAGE OF IN-CLASS INTERVIEW RESPONSE BY PROGRAM AND BY SITES WITHIN PROGRAM

Program	Mean
A	590.2*
B	564.2
C	576.9
D	607.7

Program	Site 1	Site 2
A	563.3	617.1
B	543.9	586.9
C	596.3	556.9
D	592.2	623.6

* The reader can interpret the mean 590.2 as stage 5.902.

Table 3: ANALYSIS OF VARIANCE WHERE THE DEFENDENT VARIABLE IS IN-CLASS INTERVIEW RESPONSE AND THE INDEPENDENT VARIABLES ARE PROGRAMS AND SITES WITHIN PROGRAM

Source of Variation	df	F	P
Between Program Effect	3	4.15	.0067
Within Programs			
Sites in Program A	1	8.70	.0035
Sites in Program B	1	5.41	.0207
Sites in Program C	1	4.50	.0348
Sites in Program D	1	3.00	.0841
Error	300		
Total	307		

These tables also show that there was a within program effect on means indicating in-class interview response at the .05 level of significance for sites in Program A, sites in Program B, and sites in Program C but not for sites in Program D.

The investigation used the Newman-Keuls procedure to test all possible mean differences indicating in-class interview response for programs (Winer, 1962, p. 309). The mean indicating in-class

interview response for Program D was significantly higher than those of Program B and Program C but not significantly higher than that of Program A.

On the basis of the cognitive developmental theory that the investigator wished to test, it was important to test the combination of Programs B and C versus Programs A and D to determine the relative impact of behavioristic versus developmental based programs on in-class interview response. A simple planned comparison was chosen, as this was the only linear combination that was tested. The difference between the four means indicating in-class interview response showed that the combination of Programs A and D had the highest stage of in-class interview response; as one can see in Table 4, this value was equal to 56.80. The resulting t test was equal to 3.09 and with 300 degrees of freedom, this was significant at the .01 level.

Table 4: A PLANNED COMPARISON OF MEANS BETWEEN PROGRAMS D & A VS. PROGRAMS B & C

$$t = \frac{di}{Sdi}$$

Where di is a linear combination of means for the desired comparison and Sdi is the standard error for this comparison.

$$di = (-1)(564.2) + (-1)(576.9) + (590.2) + (607.7) = 56.80$$

$$Sdi = \sqrt{6472.65\left(\frac{1}{78} + \frac{1}{76} + \frac{1}{75} + \frac{1}{79}\right)} = 18.34$$

$$t = \frac{56.80}{18.34} = 3.09 \text{ with } 300 \text{ df, } P < .01$$

These findings are substantiated by results of analysis of covariance, where the dependent variables are in-class and out-of-class interview response, the independent variables are program and sites within programs, and the covariates are pupils' age, socio-economic status, months in Follow Through, and Stanford Research Institutes' four achievement test scores.

DISCUSSION OF THE FINDINGS

Construct Validity of the Pupil Role Interview

From the perspective of cognitive developmental theory, this pilot study has provided four kinds of evidence to support the construct validity of the pupil role interview. The first bit of

evidence deals with how Lieberman's factor analysis of the 12 items in the pupil role interview neatly splits these items into two factors.* The first eight items relate to in-class interview response, and the last four relate to out-of-class interview response.

The second bit of evidence deals with the pilot study's respectable data reliability, where r equals .636 for in-class interview response and where r equals .663 for out-of-class interview response and with the pilot study's respectable inter-rater reliability, where r equals .690.

The third bit of evidence deals with the relationship between in-class and out-of-class interview response at the .01 level of significance which was predicted earlier and with the relationship between in-class interview response and SRI's verbal achievement test at the .05 level of significance.

The final bit of evidence deals with the invariant sequentiality of both in-class and out-of-class interview response.

These bits of evidence satisfy Piaget's hierarchic model as it has been satisfactorily applied to cognitive, moral, and ego-ideal development in other studies. In our own study in-class interview response is a subset of the ego-ideal. Van den Daele states, this model, "... demands only sequential invariance as a minimum requirement of hierarchization..." (Van den Daele, 1968).

Van den Daele reviewed the in-class interview questions and suggested that CCEP use four of his ego-ideal questions relating to occupational, material, and social goals. Both he and Lawrence Kohlberg at Harvard University judge the in-class interview questions to be valid in terms of Piaget's hierarchic model.

Practical and Theoretical Implications of the Results of the Study

CCEP hypothesized that there would be a relationship between Project Follow Through Programs and Pupil Role Development, and the findings confirmed this hypothesis. In particular, both the developmental based programs were higher than the behavioral modification based programs, relative to stage of in-class interview response. The resulting t test was significant at the .01 level.

To elaborate this finding, CCEP partialed out the effects of the pupils' age, SES, and MIFT on variation in the dependent variable, stage of in-class interview response and found that these covariates accounted for an insignificant amount of the variation in the dependent variable. Unfortunately, CCEP only had achievement test scores for two Follow Through Programs, Programs A and C.

The regression of the four achievement scores on the dependent variables resulted in non-significant F ratios for both variables. These ratios indicate that for the two sites that were given

* Leland Van den Daele of ETS and Lawrence Kohlberg of Harvard University gave generous counsel throughout the course of this study. Marcus Lieberman of the Laboratory of Human Development in the Graduate School of Education at Harvard University conducted and supervised all of the computer programming and analyses used in this paper.

achievement tests, the achievement scores were not strongly related to stage of in-class and out-of-class interview response.

However, the two developmental based programs were significantly higher at the .01 level relative to the stage of in-class interview response than the two behavioral based programs. Thus, it is reasonable to believe that if CCEP had used the four achievement tests as covariates with all four programs, CCEP would essentially obtain the same results.

The difference between the high and low programs is almost half a stage. The meaning of this can be inferred from the fact that it takes approximately two years for middle class children to progress from one stage to the next in the relevant range of Van den Daele's ego-ideal sequence. A half a stage might be said to represent a years growth.

This finding has several implications for cognitive developmental theory. First, on the basis of program description and Nordt's content analysis of pupil role interview responses, pupil role complexity is greater for the developmental programs than for the behavioral based programs. Second, the greater the role complexity, the greater is the opportunity for choice of role and social role taking: changing one's behavior based on the imputed view of someone else.

Finally, both Kohlberg and Van den Daele see social role taking and the development of concepts of reciprocity as two principal determinants of the development of identification with authority, i. e., the progressive internalization of standards for making decisions. (Kohlberg, 1963, Van den Daele, 1968). Indeed Nordt's, Green's and Grannis' papers specify some of the conditions for social role taking and reciprocity in various discussions of pupil involvement and the different distributions of controls over the various elements of the educational environment.

The Impact of Development on Programs

To understand better the concepts of social role taking and reciprocity, Roberts believes that this pilot study could serve as a baseline for research on the following questions:

> What impact do differently structured learning environments have on teachers' ability to adapt their responses to the developmental status of the individual child? And if there were an impact, what influence does this adaptiveness have upon pupils' most frequent stage of preferential judgment?

These questions could be answered controlling for six covariates: pupils' and teachers' age, months in the program, socio-economic status, and pupils' four achievement test scores, assuming a greater range on these variables than is represented in the present study. The result of this and all of CCEP's research could be applied in the further development of educational programs.

REFERENCES

Gurin, Patricia, et. al. "Internal-External Control in the Motivational Dynamics of Negro Youth." The Journal of Social Issues, XXV (Summer, 1969), 29-53.

Kohlberg, Lawrence. "Moral Development and Identification." Sixty-second yearbook of the National Society for the Study of Education, Part I. Chicago, Ill.: The University of Chicago Press., 1963.

Kohlberg, Lawrence, and Mayer, Rochelle. "Development as the Aim of Education." Harvard Educational Review, 42 (November, 1972), 449-496.

Lefcourt, Herbert M. "Internal versus External Control of Reinforcement." Psychological Bulletin, 65 (January, 1966), 206-220.

Leik, Robert B., and Mathews, Merilyn. "A Scale for Developmental Processes." American Sociological Review, 33 (1968), 62-75.

Van den Daele, Leland. "A Developmental Study of the Ego-Ideal." Genetic Psychology Monographs, 78 (1968), 191-256.

Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill Book Company, Inc., 1962.

Wohlwill, Joacheim. "The Measurement of Scalability for Non-Cumulative Items." Educational and Psychological Measurement, XXIII, (1963).

PUPIL ROLE INTERVIEW CONTENT ANALYSIS SUMMARY

CCEP's Pupil Role Interview Study includes an interview content analysis. The most basic questions with which we have been concerned in the content analysis are simply, how do children view their learning environment, and what aspects are most prominent in the child's eye? In pursuing answers to these questions it has become apparent that our data could lead us to more complex information about learner roles, and the influence of Follow Through programs and developmental levels on the child's perceptions. Also, we have asked, what is the match between the childs real and ideal learning environment? Each of these questions has been analyzed to a greater or lesser extent.

The interview itself asked the child a series of questions about his learning environment. Four questions were selected for this analysis: 1) real and ideal classroom activities, 2) real and ideal teacher attributes, 3) real and ideal home activities and 4) real and ideal classroom materials. Each of these questions has yielded some interesting results but time does not permit an extensive discussion of all facets of this analysis here. Therefore, just a few of the more interesting aspects of the analysis will be discussed.

The distribution of responses by developmental levels for all questions follows an interesting pattern. Levels five, six and seven tend to respond the same with their scores grouped around the expected, while level eight responds very differently. It is perhaps natural that level eight responds differently than levels five and six due to the developmental changes which occur between preoperational and concrete operational stages. However, according to Van den Daele's scheme this

change occurs between levels six and seven. The content data seems to indicate that level seven is a very weak concrete operational because their answers are similiar to those of preoperational levels five and six.

In noting the specific content of some of the level eight responses this difference seems logical. Level eight is characterized as "Functional Utilitarianism." The rationale for a level eight preference is its "easier, cheaper, better, more useful etc." The ideal teacher for many level eight pupils is the one who maintains order so that it's easier to work, or who gives helps so that learning is easier or one who teaches so the pupils can learn faster. Level eight seems to be distinguised not only by their rationale of choice but by the content of the choice. This also appears true to some extent for level seven, "Hedonistic Avoidant," for whom the ideal teacher is one who withholds punishment and controls.

An analysis of the ideal teacher responses by program reveals that Program A, characterized by "cognitive-social development" seems to perceive more possible teacher roles than the other programs. This determination was made by locating the number of categories in which at least 7% of the responses occurred. When grouped together these categories accounted for an average of 90% of all responses. The children in Program A, "cognitive-social development," perceived five possible teacher roles. The children in Program D, "parent and child development," and comparison perceived four possible teacher roles and the children in Program B, "behavior analysis," and Program C, "rationally didactic," perceived three possible teacher roles.

Developmental levels also influence the average number of

perceived teacher roles. Level eight children perceive five roles, level seven children perceive four roles and levels five and six perceive three possible teacher roles.

In examining the ideal teacher responses both by level and by program it appears that these two variables have a definite influence upon each other and therefore upon responses. This has been revealed by an analysis of ideal teacher responses within programs. There is no sure way to determine which has the greater influence, program or level, or when each is more influential. A more sophisticated statistical analysis is needed. However, there is one interesting observation about the possible "match" between program and developmental level which can be made with reference to the number of perceived teacher roles. If one looks at the number of perceived teacher roles for each level within each program the level which perceives the greatest number of roles is not always level eight but varies by descending levels in accordance with the number of roles perceived by program. Within Program A, "cognitive-social development," level eight children perceive the greatest number of possible teacher roles. Within Program D, "parent and child development," levels seven and eight perceive equally the greatest number of teacher roles. Within Program C, "rationally didactic," level seven perceives the greatest number of teacher roles. Within Program B, "behavior analysis," level six perceives the greatest number of teacher roles and within comparison classrooms level five perceives the greatest number of teacher roles. Perhaps this is an indication that each program has its peak influence at one level thereby causing that level to have a more differentiated view of the learning environment.

All in all, this interview content study has revealed some interesting things. We have learned that : 1) program influences the child's perception of his real and ideal learning environment, 2) developmental level influences the child's perception of his real and ideal learning environment, and 3) most children's real and learning perceptions are mismatched with their ideal learning perceptions. This study also seems to idicate that program and level influence each other and the child's perception of the classroom. There is also evidence that this type of interview scheme could be used to study learner role opportunities and perhaps content could be used in the determination of developmental level along with perferential choice.

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ON INVOLVEMENT

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We began our research* with the general question: what criteria can best differentiate classroom environments in terms of the degree to which they meet the cognitive needs of a given child. Generally, the recent, as well as the past, literature dealing with the differential effects of various classroom environments upon children has ktaken one of two directions. The first has been the psychometric approach characterized by applying a standarized test to the children in each environment and statistically examing the differences. For the most part this apprach has led to the hypothesis that different educational approaches really don't make a great deal of difference along a variety of cognitive and affective dimensions. The second approach has been to develop measures reflecting some particular aspect of school functioning. These results have, not surprisingly, shown each approach to be best at that particular aspect which they emphasized in their programs. The psychometric approach, we feel, is too gross, while the particular skills approach, we feel, is too content-loaded and therefore, biased.

As developmental psychologists we were interested in the question of the match, i.e., how well does a given environment meet the cognitive as well as emotional needs of the children. We believe that the degree to which a child is affectively committed to his environment is indicative of how well this match is met. By assuming this orientation we can assess the degree of match irrespectively of the

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*The research reported herein was conducted jointly with Fay W. Logan.

child's level of development, and also avoid the problem of having to deduce the child's effective environment. A review of the literature, in addition to pragmatic considerations, convinced us that a child's non-verbal behavior would most accurately reveal his authentic level of affective commitment, or what we came to term "involvement."

Development of IRIS

We decided to develop a multi-dimensional non-verbal scale of involvement which could be adapted to a time-sampling method of data collection. We termed our tool IRIS, or Involvement Ratings In Settings. The first structuring of IRIS was based on a literature search for relevant non-verbal dimensions. We then turned to the several hundred hours of videotaped second grade, Follow Through, classrooms which was collected by the Columbia Classroom Environment Project in 1971. With our initial dimensions in mind we examined the behavior which was consistently evidenced by children whom we intuitively considered to be involved, and correlatively, behavior evidenced by children whom we intuitively considered to be highly alienated from their situation. With this approach we were gradually able to specify a continuous scale from one to five along each dimension. We then refined and operationalized IRIS so that we could use it on a ten-second-observe/50-second-record schedule. A child's behavior was, therefore, sampled for ten seconds out of each minute.

Validation was further established by having three involvement "specialists"* independently rate 210 minutes of children's behavior from selected portions of the 1971 videotapes. They rated behavior

*Each in their work, a dramatic actress/teacher, a dancer/instructor, and an artist/educator, was intimately concerned with the notion of involvement.

on a scale from one to five using the same observation schedule as the authors of observing for ten seconds and recording for 50 seconds. The behavior segments rated were selected so as to reflect a wide range of children and a wide range of classrooms and pedagogical models. The authors then rated the same segments of behavior resulting in a correlation between the authors and specialists of approximately .65. We felt that this correlation, in conjunction with the self-validating procedures used to initially dimensionalize IRIS, was high enough to indicate that we were, in fact, measuring the involvement of the children. Furthermore, this correlation must be considered in light of the fact that we further operationalized our scale and also eliminated some of the initial dimensions before we began our actual study; procedures which we feel would raise the above correlation. Our final tester reliability was .76, a figure we also feel could be raised with more experience and even further operationalization.

IRIS at present consists of the following seven dimensions. Each dimension has been empirically defined for each rating from one to five, however, we will not describe them in depth here due to space considerations, and the fact that they are still in the process of being revised.

1. perseveration vs variation: has to do with the repetitiveness and variety of the child's movement.
2. gestural vs. postural: differentiates between peripheral movements generated from and with the limbs and/or face, and movements which are generated from the central body flowing outward.
3. phenomenal proximity: this category remains based upon an

empathic or intuitive judgment of how involved the child is in his interaction. We have maintained this category because of its satisfactory reliability, and as a limited confirmation of the validity of other categories by virtue of their correlation with phenomenal proximity.

4. direction: has to do with the orientation of the body and especially eye contact with the source of interaction.

5. boundaries: has to do with the degree of active control a child has over what he is doing, which can most easily be judged from the degree of assertiveness vs. passivity in the child's movements.

6. exaggerated/understated vs. appropriate: this is a somewhat subjective judgment of the appropriateness of the child's movement relative to whatever he is engaged in.

7. fragmented vs. integrated: has to do with the relatedness of the phases of activity within each observation segment.

Each child was rated in terms of his exhibited behavior rather than in terms of the degree to which he conformed to expectation. It must be noted that since IRIS was validated on a sample which was primarily black male, second grade, children whose parents were economically below the poverty line, its generalizability can only be assumed for this population until further studies are conducted with different samples. The power of IRIS, as it now stands is that a child can potentially receive a high involvement score in any environment and at any level of development.

Design of the Study

Our study was conducted in six second grade Follow Through classrooms, two from each of three distinct educational models.

Four boys were randomly chosen from each classroom and observed for two consecutive days. A Latin square design was used, with each child followed for ten consecutive minutes at a time. Exactly coordinated with our coding was an instrument designed to accurately describe the setting and type of activity* of the identical segments of behavior of the same child as that of IRIS. This tool, known as BORIS, was developed by Rochelle Mayer to whom we would like to express our appreciation for allowing us to report our data in relation to her data, and for a most enjoyable and productive dialogue throughout the project's history.

Results

Our first step in the analysis of these data was to account for the variability in the involvement scores. A one-within-two-between analysis of variance procedure was adapted to our data allowing us to compute the significance of the variance contributed by: individual children (24 in all), days (first vs. second day in each classroom), morning vs. afternoon (within each day), and classroom (out of which model differences could be generated). It must be noted that the design of the study (which was adapted primarily to the requirements of Mayer's BORIS) favored an outcome attributing most of the variance to individual children, i.e., if one or two children deviated significantly from the mean level of involvement within any given class, classroom differences would be minimized. This result was, in fact, what we found to be the case.

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*See chapter 3 of the Fifth Progress Report, Columbia Classroom Environment Project, U. S. Dept. of Health, Education, and Welfare, May 1972 for a detailed description.

In order to properly determine the variance contributed by classroom differences a much wider sampling of children would have to be observed in each classroom.

Graphically depicting our data we did indeed find that three children (each in different classrooms) seemed to account for a major portion of the intra-classroom variation. Upon eliminating these three children very clear classroom differences, and to a limited extent, program differences, emerged.

Secondly we examined how involvement varied as a function of nine general setting clusters derived from BORIS. In this case a proper statistical analysis could not be made because some of the setting clusters were filled by very few children and thus the entries were not completely independent for these cases. However, a comparison of the mean involvement for each cluster empirically yielded four descriptively distinct ordered setting properties which were derived by collapsing the original nine clusters. The most highly involving setting was one in which a cooperative mode of activity was evidenced (either teacher assisted or unsupervised). Second was an unsupervised or child centered pacing situation with either parallel or different tasks. Third was supervised activity, small to medium sized. Finally, the lowest involving setting was a teacher directed whole classroom situation. Interestingly, the pedagogical model generally yielding the highest involvement laid heavy emphasis on cooperative activities and unsupervised activities.

Two additional important results were found. First, if the child exhibited no primary focus of activity, usually manifested as a transition period between tasks, then the involvement was signifi-

cantly lower (p=.01) than when the child did exhibit a primary focus of activity. Finally, to test the obtrusiveness of the observers we examined the involvement differences between the children when they were looking at the observer as compared to all other times. The result was that they were less involved in looking at us (p=.01), thus indicating that we were not very obtrusive.

SETTING STRUCTURE AND THE PROBLEM OF THE MATCH

Joseph C. Grannis
David E. Jackson

Roberts has found that the children interviewed from two development based programs are significantly advanced in stage of pupil role development over the children interviewed from two behavior modification programs. This finding confirms CCEP's hypothesis that the availability of alternative learner roles in a classroom contributes to pupil role development. Nordt's content analysis of the children's interview responses adds weight to this interpretation, as the children in the development based programs in fact reported more varied teacher roles, from which we infer pupil roles reciprocally. Again, Nordt found that children at the higher stages of pupil role development reported more teacher roles than children at the lower stages of development.

In line with the findings of recent research in ego ideal development (Van den Daele, 1970) and moral development (Turiel, 1966), Roberts has speculated that a discrepancy of one stage between the (higher) role opportunity available to an individual child in a classroom and his/her present (lower) stage of pupil role development would constitute an optimal match for the individual child's pupil role development.

Just how a teacher would adapt his or her behavior toward

each child directly is highly problematic. One clue is afforded, however, by the strategy of the current moral education work of Kohlberg and his associates. By creating a situation in which the diversity of levels of justification among different children is made apparent and operative in their interactions with the teacher and with one another, the probability that each child will be exposed to a next higher stage is deliberately increased. This, then, may relate to the dynamics of pupil role development in different Follow Through sponsors' classrooms, in a manner consistent with CCEP's findings.

Certainly research can and will be directed to this formulation of the question of the match, as Roberts proposes. I would now like to suggest how this research relates to another line of investigation in the Columbia Classroom Environments Project, and in the process of this to suggest a qualification to the significance of the Pupil Role Interview findings.

Greene has reported here his pilot research on various non-verbal indices of affective arousal as an index of pupils' involvement in different classroom settings. Following the line of thinking pointed to by Piaget, Kohlberg, and J. McVicker Hunt, among other developmentalists, Greene has assumed that an optimal level of this affective arousal or involvement is an index of the appropriateness of the match between the pupil and the learning setting. Let us add to this Jackson's (1970) linking of involvement with attentiveness, which in a number

of studies over the last several decades has consistently correlated with children's achievement on the tasks attended to.

Greene reports his finding that children's involvement was highest in the classrooms observed in the more pupil controlled or pupil centered settings, especially those that entailed cooperative interaction among the children, with or without the teacher as a participant in this cooperation. To some this might be an appealing finding. However, it happens to stand in potential conflict with CCEP's theoretical expectations generally, as well as with Greene's own supposition that involvement is a measure independent of setting, i. e., that involvement can be potentially high or low in any classroom setting.

One resolution of this seeming contradiction is suggested by Grannis and Jackson's study of a set of 20 all-day behavior stream observations of individual children in the classrooms of 4 sponsors, three of them the same sponsors A, B, and C referred to in the previous papers, and the fourth an "open classroom" sponsor outside of Follow Through. The basic finding, which will be elaborated below to some extent, is that children have been observed to be more on-task in settings in which the distribution of controls between the teacher and the pupil is congruent or internally consistent, as opposed to those settings in which this distribution of controls is less congruent. Thus, for example, children are more likely to be found to be on-task when they are pacing themselves on a task selected by themselves

than when they are pacing themselves on a task selected by the teacher. As a first approximation to resolving our contradiction, therefore, it is possible that the settings in which Greene observed children to be less involved were in fact less congruently structured with respect to controls. This is not the whole solution, however. In order to illuminate both parts of it I need to say more about the behavior stream research.

Grannis and Jackson's study coded every 30-second interval of the typed behavior stream observation records[20] on each of 62 variables. A total of approximately 9800 30-second behavior stream intervals were coded for the analysis I am reporting here. This specific analysis related the observed children's "on-task" and "off-task" behavior to various properties of the settings in which it occurred. On-task/off-task behavior was judged, not didactically or moralistically, but in relation to the structure of the episodes identified in the behavior stream records. In other words, on-task/off-task behavior is a measure of the child's orientation to the goal that stands at the end of an episode in the behavior stream record, or, conversely, a measure of the child's being in "passive arrest" (waiting, gazing, etc.) or in "active arrest" (oriented to a goal that is an alternative to the goal of the main behavior episode in question.) Thus a child's attending to another child's art activity as an alternative to his/her own arithmetic workbook activity is coded off-task, irrespective of the edu-

cational value of his attending to the art activity.

Paul Gump's pacing variable was taken as the baseline for our determining the congruency or incongruency of other control variables in a given setting. Pacing is the degree to which the teacher regulates the learner's work or energy output. It is coded high, medium, or low. Task options (prescribed or open), material responsiveness (no feedback, low feedback, high feedback), and child-child interaction (low, medium, or high expectations) were each construed on a continuum of high teacher control to high child control in the direction indicated by the order of the categories.

The analysis with these four variables strongly supports the hypothesis that congruent distributions of controls in learning settings result in more goal directed behavior than incongruent distributions of controls. Those settings that were congruent on all four variables had the smallest percentage of off-task behavior, an average of 9.2%. Those settings which had three variables consistent had the second smallest percentage of off-task behavior, an average of 12.4%. Those settings which had only two variables consistent had the third smallest percentage of off-task behavior, an average of 19.8%. Finally, those settings which had only one variable consistent (that is, three variables inconsistent with pacing) had the largest percentage of off-task behavior, an average of 30.1%. (This last statement has an internal consistency of its own!

However, we have determined congruency with respect to pacing, rather than strictly by the numbers, because (1) pacing is virtually a stand-in for several other control variables not included in this analysis, expectation teacher attend, expectation teacher address, and initiation of teacher-pupil interactions, and (2), perhaps more fundamentally, because pacing may be the strongest/phenomenal indicator to an individual of who is in control of a situation.) The average percentage off-task for settings with congruent and incongruent distribution of controls is presented in Table 1. The tests of significance that were computed on these figures are also presented in Table 1. The percentages are significantly different from each other at the .05 level of significance for 5 of the 6 comparisons, i. e., for all except the comparison between those settings which had four variables consistent and those which had three variables consistent.

A more specific analysis examined the contribution of each of the four control variables separately by holding various combinations of any three of the variables constant and then looking at the difference between off-task behavior when the fourth variable is varied. 18 of the 21 comparisons made in this way were in the predicted direction, a result that is significant at $p < .001$.

This analysis, then, would support an interpretation of Greene's findings to the effect that those settings in which he observed less involvement were less congruently structured.

Table 1: AVERAGE OFF-TASK PERCENTAGE FOR SETTINGS WITH CONGRUENT AND INCONGRUENT DISTRIBUTION OF CONTROLS

	Number of Variables Consistent with Pacing			
	4	3	2	1
% off-task	9.2	12.4	19.8	30.1
# of minutes observed	1494	910	752	483

Dunn's (1961) method for simultaneous estimation of predetermined contrasts was applied to the above binomial proportions. The following six contrasts were computed: 1) 9.2-12.4, 2) 12.4-19.8, 3) 19.8-30.1, 4) 9.2-19.8, 5) 9.2-30.1, and 6) 12.4-30.1. All but the first contrast were simultaneously significant at p=.05 level of significance.

Olive Jean Dunn (1961), Multiple Comparisons Among Means, J. Statist. Assoc., 56: 52-64.

In saying this, let us note that Greene found that his involvement indices correlated positively with an approximation to our own on-task/off-task measure, the latter judged independently by the BORIS observer, in all 9 of the settings identified with the BORIS scheme.

The trouble with this interpretation, however, is that high teacher paced settings were generally more consistently structured than low teacher paced settings in our behavior stream data. While our findings probably have some bearing on the relative rankings of the medium and low teacher paced settings, Greene's findings for the high teacher paced settings still present a conundrum.

Further clarification of this problem is suggested by a consideration of the educational goals of the different settings involved in both Greene's and Grannis and Jackson's data. Grannis and Jackson have reformulated the control dimensions used for the analysis reported here to present a more orderly scheme of 6 control dimensions, each of which is construed as having the three positions, teacher control, joint teacher and child control, and child control. We have also defined a dimension of educational goals as follows:

COMMUNALITY-INDIVIDUATION OF THE GOAL: The degree to which the educational goal gives priority to common, or, conversely, individuated learning and development. Intellectual, social, physical, and emotional learning and development are equally involved in each of these categories of educational goals. (1) Transmission of common knowledge, traditions, and experiences; virtually no individuation. (2) Partial individuation: the operationalization of specific competencies, or the inter-

nalization of concepts, skills, and dispositions. (3) Major individuation; the cultivation of individual and collaborative venture or the application of knowledge etc. to exploration, problem solving, and expressive design or composition.

Our basic hypothesis continues to be than educational setting will be more effective to the extent that the controls in the setting are congruent. Operationally, this now means that the most effective settings will consist of all 1's, 2's, or 3's on the setting control variables and a 1, 2, or 3 on the goal variable correspondingly. Let us claim simply that type 1 goals are severely underrepresented in most contemporary classrooms. One does observe children's chanting numbers or the alphabet in ways quite appropriate for the type 1 setting, even if this often appears to be overlearning in the service of good group feeling. However, origin stories, ceremonies, the names of significant persons, places, and things in the learner's culture, these and much more are involved in the transmission of common knowledge, traditions, and experience, so long as the teacher represents to the learner a shared culture, not an alien culture to be imposed on the learner. 'Traditional" teaching, which we associate not only with type 1 goals but with the whole array of type 1 setting conditions, has been abused to the extent that it has been used in disregard of the learner's culture, or as it has been used inappropriately to demand the operationalization (as opposed to simply modeling) specific competencies that we would characterize as type 2 learning.

Certainly some transmission of the ethnic, national, and or Western cultures common to one or another group of children was observed in traditional settings in every classroom we observed. We maintain, however, that this goal is least understood and valued in contemporary pedagogy, and that children's low involvement in teacher controlled settings has much to do with this.

Let us now venture three last hypotheses.

First, the best predictor of academic skill and concept achievement in Follow Through classrooms should be the time children spend pursuing type 2 academic goals in congruently structured type 2 settings. Soars and Soars' data (1972) very strongly supports this hypothesis. Congruent type 2 settings, however, are relatively scarce in the programs we have observed, and in classrooms generally, partly because the polarization of teacher and child centered pedagogies contributes to incongruous mixes of type 1 and type 3 controls. A fall back prediction, therefore, is that Follow Through children's achievement will be proportional to the time spent in a combination of type 2 and what might be characterized as more test-like settings, incongruent types 2 and 3, multiplied by the on-task percentages that can be associated with these different settings.

Secondly, the degree of congruence in one or another classroom's settings will have something to do with the children's pupil role development. It happens that the rank order

of the three programs, A, B, and C, common to both Roberts' and Nordt's pupil role development study and Grannis and Jackson's study of setting congruency is the same for percentage of consistently structured settings observed in the programs and for the average stage of the children's pupil role development.

Finally, because pupil role development represents, like all such developmental measures, an estimate of a person's individuation (since the universality of standards the person develops obtains increasingly in the individual's internalized thought and action, rather than in external relations to the group), it is possible that pupil role development would correlate zero or even negatively with certain affective estimates of the individual's self concept. At least this might be true to the extent that individuation was obtained at the expense of identification with the learner's culture of origin, in which case alienation from this culture might be involved. This, then, points again to the necessity of taking seriously the transmission of the learner's own culture in his education.

References

Robert S. Soar and Ruth M. Soar, "An Empirical Analysis of Selected Follow Through Programs: An Example of a Process Approach to Evaluation," in Ira J. Gordon (editor), Early Childhood Education, The Seventy First Yearbook of the National Society for the Study of Education, University of Chicago Press, 1972.

E. Turiel, "An Experimental Test of the Sequentiality of Developmental Stages in the Child's Moral Judgment," J. Pers. Soc. Psychol., 1966, 3, 611-618.

Leland Van den Daele, "Pre-School Intervention Through Social Learning for Disadvantaged Children," Journal of Negro Education, Fall, 1970.