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ABSTRACT

This study examines the effectiveness of an open classroom socialization process employed in an experimental compensatory education program in terms of one of its objectives. The five-year Education Improvement Program (EIP) used behavior modification treatments to promote a style of pupil behavior described as self-directed, independent, and problem-solving. It was hypothesized that enabling pupils to develop an individual style of learning would result in greater knowledge of academic subject matter than would the conforming style of pupil behavior typcial of traditional school environments. The study was guided by the question of the effect of an open educational environment on academic achievement of culturally disadvantaged elementary school children. The measure of open classroom behavior was gathered using CASES (the Coping Analysis Schedule for Educational Settings). The results suggest that for three of the four academic areas studied, the traditional classroom environment (teacher-directed) may be inappropriate with the culturally disadvantaged. Open classrooms seem to be appropriate for learning reading and arithmetic. Caution should be exercised in generalizing the findings. (Author/NG)

Using CASES in Measuring Effects of Compensatory Education

Mary R. Papageorgiou

Recent concern in the field of education has been for educating the culturally disadvantaged. One of the methods considered viable is an open classroom system which allows pupils to learn through concrete experience, at their own pace, and in the direction of their own interests.

The purpose of this study was to examine the effectiveness of an open classroom socialization process employed in an experimental compensatory education program in terms of one of its objectives, academic achievement. The five-year Education Improvement Program (EIP) in Durham, North Carolina, used behavior modification treatments to promote a style of pupil behavior described as self-directed, independent and problem-solving. It was hypothesized that enabling pupils to develop an individual style of learning would result in greater knowledge of academic subject matter than would the conforming style of pupil behavior typical of traditional school environments.

The following questions guided this study: What is the effect upon the academic achievement of culturally disadvantaged elementary school children of an open classroom environment? Specifically, is academic achievement a function of the degree of "desirable" open classroom behavior? Is academic achievement a function of conformity? Does initial intelligence level affect any of these relationships?

The study was designed to test the following hypotheses:

1. The degree to which pupils exhibit "desirable" open classroom behavior is positively related to academic achievement.
2. Self-directed classroom behavior is positively related to academic achievement.
3. Conforming classroom behavior is positively related to academic achievement.
4. Self-directedness is more positively related to academic achievement than is conformity.
5. Self-directedness, conformity, and overall "desirable" open classroom behavior, each account for variation in academic achievement over and above that accounted for by IQ alone.

Methods and Procedures

The measure of open classroom behavior was gathered using CASES (the Coping Analysis Schedule for Educational Settings). CASES normative data were gathered annually over the last four years of the experimental EIP (1966-1970). In early spring ten minute random interval time samplings were taken several times in different classroom settings. Settings were classified as teacher-directed (traditional classroom method in which conformity is desirable), and

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Note: This article is based on a paper presented at the annual meetings of the American Educational Research Association, February 28, 1973; New Orleans, LA.

non-teacher directed (open classroom method in which self-directedness is desirable). The appendix to this paper explains the CASES instrument. The CASES Computation Worksheet in the appendix explains the derivation of the six CASES Style Coefficients and the Overall CASES Coefficient.

The Overall CASES Coefficient is a weighted ordinal scale, reflecting the objectives of EIP in classroom behavior. The weights are assigned according to an ordered preference for CASES behavior styles. That order, from most to least preferred is: Style F (self-directed, socially integrative), E (conforming), D (peer dependent), and grouped into one rank - A (dominative), B (passive-aggressive), and C (withdrawn). The Overall CASES Coefficient measures the extent to which each subject approximates the preferred order of behavior. The range of the scale is from 1.0 (undesirable) to 4.0 (ideally desirable).

To clearly distinguish between self-directed and conforming pupils, CASES data gathered in non-teacher-directed (N-TD) settings were used. Teacher expectations and reinforcement schedules in N-TD settings allow a greater opportunity for pupils to exhibit self-directed behavior than do the teacher-directed (TD) settings, in which conforming behavior is generally expected and reinforced. The assumption was made that pupils who are in fact self-directed will exhibit greater Style F behavior in N-TD settings than in TD settings, whereas pupils who are in fact conforming will exhibit a preponderance of Style E regardless of classroom setting. The greater range for variance of styles in the N-TD settings, therefore, provides a finer basis for discriminating between the two.

Use of the mean Overall CASES Coefficient (the average of each subject's Overall CASES Coefficient over his entire duration in the treatment program) was an attempt to estimate the aggregate effect of the treatment. Each subject's last measure of CASES Styles E and F estimated the terminal effect of the treatment, regardless of previous measures of self-directedness and conformity.

Analysis

A series of step-wise multiple regressions was used to test the hypotheses. Each subject's first Stanford-Binet IQ, mean Overall CASES Coefficient, and last Style E and F entered the regression equation as independent variables to predict each of the following dependent variables: Word Knowledge, Word Discrimination, Reading, and Arithmetic - subtests of the Metropolitan Achievement Test. The simple correlation matrix gives the coefficients for testing the first four hypotheses (see Table 1 for the zero order correlations between each of the three CASES variables and each of the MAT subtests). The partial correlation coefficients in the regression equations were used to test hypothesis #5 concerning the predictive value of each of the three CASES variables over and above the predictive value of initial IQ (see Table 2 for the first order correlations with IQ partialled out).

Results

Hypothesis #1 was accepted for only one of the four dependent variables. The mean Overall CASES Coefficient was found positively related to achievement in Reading ($p<.05$).

Hypothesis #2 was also accepted for only one of the four dependent variables. Self-directedness (last Style F) was found positively related to achievement in Word Knowledge ($p<.05$).

Hypothesis #3, that conformity (last Style E) is positively related to achievement was rejected for all dependent variables. Table 1 indicates that the relationship was opposite of that predicted. The probability that these negative correlations were due to chance alone, is, for Word Knowledge and Word Discrimination, less than 5%, and for Reading, less than 1%.

Hypothesis #4 (that self-directedness is more positively related to achievement than is conformity) was tested by comparing the tests of hypotheses #2 and #3. The hypothesis was accepted for Word Knowledge in which case Style F was found positively related at a significant level and Style E was found negatively related at a significant level. In the cases of Word Discrimination, Reading, and Arithmetic the following t values indicate whether or not the two correlations (with CASES Styles E and F) are significantly different from each other:*

Word Discrimination	$t = -2.683$	$p<.01$
Reading	$t = -3.105$	$p<.01$
Arithmetic	$t = -1.2847$	*NS*

A significant difference was found between the correlations of Style E and F in both Word Discrimination and Reading. That is, the positive correlations between Style F and each of the two achievement measures are significantly different from the negative correlations between Style E and the same two achievement measures. In Arithmetic the correlations are not significantly different from each other. Hypothesis #4 was, therefore, also accepted for Word Discrimination and Reading, but rejected for Arithmetic.

Implicit in Hypothesis #5 was the assumption that initial IQ would consistently be the greatest predictor of academic achievement. This assumption was verified by the series of regression equations. The first order correlation coefficients with IQ partialled out (see Table 2) showed support for Hypothesis #5 in the following instances:

(a) The mean Overall CASES Coefficient had predictive power over and above IQ in predicting Reading ($p<.01$), and Arithmetic ($p<.01$). In the case of Arithmetic IQ acted as a suppressor variable and partialing it out allowed the mean Overall CASES Coefficient to reach significance. (Note that the simple correlation coefficient

* See Table 1 for the values of these correlation coefficients.

between the mean Overall CASES Coefficient and Arithmetic, reported in Table 1, is not significantly different from zero. In Table 2, the partial r is significant).

(b) Self-directedness (Style F) had predictive power over and above IQ in predicting Word Knowledge ($p<.005$), and Reading ($p<.05$). In the case of Reading IQ again acted as a suppressor variable.

(c) Conformity (Style E) had predictive power, in the direction opposite of that hypothesized, over and above IQ with Word Knowledge ($p<.025$), Word Discrimination ($p<.025$), and Reading ($p<.01$). A two-tailed test was used to determine the significance of these unpredicted negative correlations.

Discussion

Caution must be exercised in the interpretation of these results. The non-randomness of the 179 subjects of this study limits the generalizability of the results and leaves room for selection biases. Even with the constraint in mind, the following points may be considered of general interest:

1. The negative correlations between pupil conformity and achievement in three of the four academic areas suggest that for culturally disadvantaged elementary pupils the traditional teacher-directed classroom methods may be inappropriate.

2. (a) The positive correlation between overall desirable classroom behavior and Reading may imply the appropriateness of the open classroom method in developing this skill.

   (b) The stronger correlation between overall desirable classroom behavior and Arithmetic when the effect of IQ is removed, may mean that in teaching this skill, methods may be more effective when prescribed according to ability level of the pupil.

3. The implication of 2 (a) above applies to the relationship between self-directedness and Word Knowledge. The implication of 2 (b) applies in the case of self-directedness and Reading.

Since the termination of the Durham compensatory education program (EIP), the methods of training teachers in the use of the reinforcement schedules have been refined. The results of this study may reflect the fact that in the first three years of the project the teachers were still in the process of learning the behavior modification techniques. Because of this time lag pupils may not have attained the levels of self-directedness and overall desirable behavior of which they were capable.

Another plausible explanation for the results of this study is the choice of the Metropolitan Achievement Test as the measure of academic achievement. The MAT, which at the elementary levels measures largely rote-memory skills, may not be a valid measure of achievement in classrooms where problem-solving skills are stressed.

The value of these results is largely that the trends brought to light can be examined more definitively in a replication of the study. The questions to which this study were addressed can better be answered using subjects who are randomly selected and assigned to classrooms where the refined teacher training methods have been effectively applied.

Table 1

Simple Correlation Coefficients between CASES Variables and MAT Subtests

	CASES Variables		
	Mean Overall CASES Coefficient	Last Style F Coefficient	Last Style E Coefficient*
Word Knowledge	0.10656	0.19428 ($p<.05$)	-0.22732 ($p<.05$)
Word Discrimination	0.05434	0.10203	-0.22738 ($p<.05$)
Reading	0.18496 ($p<.05$)	0.12672	-0.25417 ($p<.01$)
Arithmetic	0.13081	0.07035	-0.09179

The significance levels reported in the table indicate the probability that the correlation coefficient is different from zero.

* Where negative correlations appear a two-tailed t test was used.

Table 2

First Order Correlations between MAT Criteria and CASES Predictors (with Initial IQ Partialled Out)

	Predictors					
	Mean Overall CASES Coefficient		Last Style F Coefficient		Last Style E Coefficient*	
	Multiple R	Partial r	Multiple R	Partial r	Multiple R	Partial r
Word Knowledge	0.40427	0.09853 t=1.31349	0.43695	0.20556 t=2.78656 (p<.005)	0.42937	-0.18570 t=-2.50722 (p<.025)
Word Discrimination	0.41255	0.04125 t=0.54772	0.4220	0.10578 t=1.41126	0.44394	-0.18450 t=-2.49046 (p<.025)
Reading	0.46341	0.18570 t=2.50719 (p<.01)	0.44868	0.1340 t=1.79384 (p<.05)	0.47288	-0.21302 t=-2.89245 (p<.01)
Arithmetic	0.27562	0.12469 t=1.66721 (p<.05)	0.25663	0.06913 t=0.91937	0.25389	-0.05739 t=-0.76267

Criterion Variables:	Mean	S.D.
Word Knowledge	41.50	11.53
Word Discrimination	42.56	11.85
Reading	42.36	9.40
Arithmetic	44.22	16.04

Predictor Variables:	Mean	S.D.
First S-B IQ	90.42	16.99
Mean Overall CASES	2.84	0.36
Last Style F	0.90	0.21
Last Style E	0.69	0.31

N = 179

* Unpredicted negative partial correlations were tested with a two-tailed t test.

APPENDIX

THE COPING ANALYSIS SCHEDULE FOR EDUCATIONAL SETTINGS (CASES)

The Coping Analysis Schedule for Educational Settings (CASES) was developed over a period of approximately seven years as a result of more than 1,000 case studies of normal children in on-going public school classrooms, Head Start centers, and other educational settings. Its categories are based on ego theory and reflect a number of dimensions of personality development.

It was designed to measure the process of normal personality development and socialization occurring in structured settings. It consists of 13 basic categories of "coping" behaviors[1] identified by descriptive statements. Subscripts are added to six categories to allow coding of child behavior in terms of adult or cultural expectations (as determined by the setting). The augmented list numbers 19 categories. A brief form of CASES is given in Appendix A.

CASES categories are arranged with more active coping categories grouped at one end and more passive categories at the other, but the numbers do not represent a scale. Various psychological dimensions were used in the development of the schedule. Basic to its development were the concepts of "integrative" and "dominative" social behavior as delineated in the work of H.H. Anderson. In addition to the generally "active" and "passive" styles of child response to environmental stimuli, CASES includes categories which reflect "overt aggression," "passive aggression," "independence," "autonomy," "dependence," "avoidance," and "withdrawal."

The Coping Analysis Schedule for Educational Settings (CASES) permits the coding of all observable behavior in the classroom into one or another of

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[1] The term "coping" and many of the ideas implicit in CASES came from the work of Lois Murphy, especially from her book, Methods for the Study of Personality in Young Children. New York: Basic Books, 1956.

the 19 categories. Of the 13 basic categories, all but one, "responding to internal stimuli" (12), are designed to characterize a person's economy with the external environment. How a given individual manages this economy is assumed, in this system of analysis, to be of crucial importance in the development of his social relations and, ultimately, his overall cultural adequacy. The particular categories delineated in CASES were refined empirically through individual case studies conducted by students and research personnel at the Universities of Illinois, Hofstra, and Duke over a period of seven years. In its present form CASES provides a comprehensive technique of characterizing overt coping behavior in the classroom (or in any social setting). Combinations of category frequencies are normally used to produce coefficients representing six "styles" of coping behavior and an overall coefficient which reflects an individual's overall coping competency in the type of settings observed. The six styles are based on the literature on personality development and are identified by letters and descriptive terms as follows:

Style A: Dominative, active, annoying, bothering, controlling
Style B: Resistant, passive aggressive, delaying, cautious
Style C: Dependent, passive, withdrawn, fearful, watchful
Style D: Talkative, peer dependent, social, gregarious
Style E: Obedient, submissive, compliant, conforming, cooperative
Style F: Assertive, thoughtful, socially integrative, productive

The instrument is open ended in the sense that it may be used by a variety of teachers and researchers for a variety of goals. It is useful as a means of measuring change in the overall process of socialization as well as providing day to day feedback to teachers on the effectiveness of specific techniques of classroom management and instruction. It has been used effectively with children as young as two. It has also been used to measure coping styles in adults in retirement homes, university classes, and hospital wards. Attempts to use it with severely autistic children have been generally unsuccessful since most or all of the observed economy with the environment in their case is unconventional and difficult to interpret in ego terms.

CASES data can be taken continuously or by means of time sampling techniques. Individual profiles or group norms by category or style can readily

be obtained. The most useful analysis involves the use of CASES "style" Coefficients or an Overall CASES Coefficient of coping competency (See Appendix A). The Overall CASES Coefficient has been found in one study to be related significantly to achievement in reading and vocabulary development. (Spaulding and Papageorgiou, 1972).

Observers can be trained in approximately two to three weeks. It is customary to obtain reliabilities of observation and recording in the high eighties or low nineties. The primary method of training is simultaneous observation of selected children (displaying differing coping "styles") by two observers. Data are gathered first by the method of specimen description (followed by coding of the specimen description outside the classroom) and later by coding in the setting as the behavior occurs (on first a 30 and then a 15 or 10 second sampling schedule).

Group training is conducted by means of video tape recordings. The same procedure is used as in the live situation, although the video tape arrangement permits replay and analysis at each point in the flow of behavior. With video tape equipment it is possible to omit the use of specimen descriptions and obtain reliability by coding short sequences on video tape and then reviewing the sequences several times to clarify coding disagreements.

Data are gathered normally using a data sheet with columns marked for each CASES category. The totals for each category are then transferred to the work sheet to obtain the six Style Coefficients and the Overall CASES Coefficient (Examples are given in Appendix A).

The Style Coefficients are designed to reflect the responses of teachers and others to the type of child behavior described by each CASES Coping Style. When a Style Coefficient reaches a value of 1.00 the behavior pattern is defined as dominant and it is readily "visible" to most observers. The "visibility" threshholds for each of the six CASES Coping Styles were obtained empirically and reflect the common awareness of teachers to types of pupil -

behavior in conventional or traditional school settings. The coefficient value of 1.00, therefore, is a relative value and is useful, primarily, as a rule of thumb in determining the type of classroom treatment most likely to be effective in modifying the process of socialization for a given child. Style E and F Coefficients, also, have been found to be distributed approximately normally in several conventional settings and can be used as behavioral objectives in specific classroom intervention programs. For example, a target value of 1.00 in Style E behavior in teacher directed settings or in Style F in all settings can be used as a performance criterion.

The Overall CASES Style Coefficient is especially useful as a target variable since it is weighted to reflect cultural expectations in normal personality and social development. It has been found normally distributed and correlated positively with reading and vocabulary development.

Construct validity has been suggested by the ease by which teachers and others familiar with child development and personality theory have obtained reliability of observation and recording. Significant correlations of the Overall CASES Coefficient with achievement test scores (Metropolitan Achievement Test) found in a sample of 180 economically disadvantaged primary school children give further support to the construct validity of the instrument.

Reference

Spaulding, R.L., & Papageorgiou, M.R. *Effects of early educational intervention in the lives of disadvantaged children.* Final Report, USOE Project #1-I-124, San Jose: California State University, San Jose, 1972.

Appendix A

A Coping Analysis Schedule
for Educational Settings (CASES)*

(Brief Form for Quick Reference)**

1. Aggressive Behavior:
Direct attack: grabbing, pushing, hitting, pulling, kicking, name-calling; destroying property: smashing, tearing, breaking.

2. Negative (Inappropriate) Attention-Getting Behavior:
Annoying, bothering, whining, loud talking (unnecessarily), attention getting aversive noise-making, belittling, criticizing.

3. Manipulating, Controlling, and Directing Others:
Manipulating, bossing, commanding, directing, enforcing rules, conniving, wheedling, controlling.

4. Resisting:
Resisting, delaying; passive aggressive behavior; pretending to conform, conforming to the letter but not the spirit; defensive checking.

5. Self-Directed Activity:
Productive working; reading, writing, constructing with interest; self-directed dramatic play (with high involvement).

6. Paying Close Attention; Thinking, Pondering:
Listening attentively, watching carefully; concentrating on a story being told, a film being watched, a record played; thinking, pondering, reflecting.

7. Integrative Sharing and Helping:
Contributing ideas, interests, materials, helping; responding by showing feelings (laughing, smiling, etc.) in audience situations; initiating conversation.

8. Integrative Social Interaction:
Mutual give and take, cooperative behavior, integrative social behavior; studying or working together where participants are on a par.

9. Integrative Seeking and Receiving Support, Assistance and Information:
Bidding or asking teachers or significant peers for help, support, sympathy, affection, etc., being helped; receiving assistance.

** Revised August 12, 1968.

10. Following Directions Passively and Submissively:
Doing assigned work without enthusiasm or great interest; submitting to requests; answering directed questions; waiting for instructions as directed.

11. Observing Passively:
Visual wandering with short fixations; watching others work; checking on noises or movements; checking on activities of adults or peers.

12. Responding to Internal Stimuli:
Daydreaming; sleeping; rocking or fidgeting; (not in transaction with external stimuli).

13. Physical Withdrawal or Passive Avoidance:
Moving away; hiding: avoiding transactions by movement away or around; physical wandering avoiding involvement in activities.

Note: Categories 3, 5, 6, 7, 8, and 9 are further coded as a or b in structured settings to indicate appropriate or inappropriate timing or location of activity (based on the teacher's expectations for the setting). Example: 5a would be recorded when a child was painting during art period (when painting was one of the expected activities). Painting during "story time" or in an academic setting would normally be coded 5b. The code b represents behaving in a certain coping category at the "wrong" time or place. What is "right" or "wrong" is based on the values and goals of the teacher or authority responsible in a given situation.

A child might be sharing with another child in an integrative manner (7) some bit of information the teacher regarded as highly inappropriate. It would be coded as 7b since it was an integrative act of sharing occurring at the "wrong" time in the "wrong" place, from the point of view of the teacher.

School Lawrence (Teacher: Moore) Observer C.R.

Grade 2nd (Sally Lindley) Date 4/26/71

CASES Data Sheet

Beginning Time 10:12 End Time 10:19

Setting (situation and activity) Group meeting to discuss information to be used in filling out an information sheet about a grocery store. Teacher directed, listening, watching, oral response setting (TD - LV - A - O)

	CASES CATEGORY													STARS*			Notes and
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	Teacher	Cog.	Soc.	Setting Chang
:00						1											
10							1										
20								1									
30										1							
40											1						
50						1											
1:00								b									
10								b									
20							1										
30					b												
40							1										
50										1							
2:00						1											
10					b												
20											1						
30											1						
40											1						
50											1						
3:00						1											
10						1											
20									1								
30					b												
40								1									
50							1										
4:00										1							
10											1						
20												1					rubbing face
30										1							
40										1							
50					b												
5:00										1							
10										1							
20										1							
30					b												
40					b												
50					b												
6:00						1											
10		1															
20					b												
30	1																
40							b										
50							b										
Σ a	1	1				6	4	2	1	8	6	1					
Σ b					8		2	2									

*Teacher behaviors are coded immediately following CASES time samples. STARS codes are use cognitive (cog.) or social behavior (soc.) columns as appropriate.

Fig. 1. Sample record sheet to gather pupil data using CASES and STARS.

CASES Computation Work Sheet

School Lawrence Teacher Moore Observer C.R. Date 4/26/72

Subject (Child's code name) Sally L. Setting TD-LV-A-O (Group Meeting)

CASES f		STYLE A		STYLE B	
1	1	1	1	4	
2	1	2	1	5b	8
3a		3b		6b	
3b		Total A	2 (2)	Total B	8 (4)
4		(2) ÷ (1) =	.05 (3)	(4) ÷ (1) =	.19 (5)
5a		(3) ÷ .03 =	1.67 (A)	(5) ÷ .10 =	1.90 (B)
5b	8	STYLE C		STYLE D	
6a	6	9b		7b	2
6b		11	6	8b	2
7a	4	12	1	9b	
7b	2	13		Total D	4 (8)
8a	2	Total C	7 (6)	(8) ÷ (1) =	.10 (9)
8b	2	(6) ÷ (1) =	.17 (7)	(9) ÷ .15 =	.67 (D)
9a	1	(7) ÷ .15 =	1.13 (C)	STYLE F	
9b		STYLE E		3a	
10	8	5a		5a	
11	6	7a	4	6a	6
12	1	9a	1	7a	4
13		10	8	8a	2
		Total E	13 (10)	Total F	12 (12)
		(10) ÷ (1) =	.31 (11)	(12) ÷ (1) =	.29 (13)
		(11) ÷ .80 =	.39 (E)	(13) ÷ .85 =	.34 (F)
Xf	42 (1)				

Overall CASES Coefficient

Step 1		Step 2			Step 3	Step 4
Style A Coefficient	1.67 (A)					
" " B " "	1.90 (B)	(14) ÷ (15) =	.77	x 1 =		.77
" " C " "	1.13 (C)					
Sub-Total (A+B+C)	4.70 (14)					
Style D Coefficient	.67 (D)	÷ (15) =	.11	x 2 =		.22
" " E " "	.39 (E)	÷ (15) =	.06	x 3 =		.18
" " F " "	.34 (F)	÷ (15) =	.06	x 4 =		.24
Total (A+B+C+D+E+F)	6.10 (15)	Total	1.00	Total		1.41