Social Class, Race, and Psychological Development

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CHAPTER NINE

A Nonpsychological Approach to Early Compensatory Education

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Many graduate students in education reveal a monstrous educational handicap when they enter their first statistics course. They are baffled, terrified, rigid, forget things as soon as they learn them, and often leave the course with practically no transferrable knowledge. Suppose that a benign college administration decided to give these students some compensatory education, a subsidized eight weeks of experiences aimed at enabling them to start statistics on a more nearly equal footing with those privileged students whose undergraduate backgrounds had not been barren of mathematics. Here is a transcript of discussion in a committee drawn together to plan Project Head Stat.

"Perhaps you're wondering why I've asked such a variety of experts to sit in with us. Well, these are multi-problem kids. . . ."

"The thing that really grabbed me was I noticed a lot of them couldn't even add fractions. . . ."

"How do you know it isn't that they're just not motivated? Their values are different from science students'. They just don't give a damn about the sum of cross-products."

"You've got to develop positive attitudes toward stat. So make it mostly

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fun, with a warm accepting teacher and lots of brightly colored calculators around the room."

"You don't realize how deprived most of these students are. Why, half the students in my class last year had never seen a slide rule. They'd never lit a Bunsen burner. They didn't know the difference between mass and weight."

"How can we expect to make up for years of deprivation like that in eight weeks?"

"We can't, but we have to start someplace. Now a trip to the Museum of Science and Industry. . ."

"How about giving them some lessons in algebra?"

"Whoa, there! It's understood this is not to be a downward extension of statistics class. If we started trying to ram algebra down their throats we'd only succeed in teaching them to hate stat eight weeks earlier."

"Let's not forget that we're dealing with individuals and every one is different. I'd suggest a complete battery of aptitude and personality tests. . . ."

"We need a theoretical rationale for what we're doing. Now from a Piagetian point of view the problem can be seen as one of failure to attain the level of formal logical operations."

"It's in the medulla, I think. I'd have to look it up but I believe numerical reasoning is in the medulla."

"We really ought to involve the students' wives in this too. After all, it won't do any good to change their behavior here in school if it's all undone when they get home at night."

I should like to believe that no such interchange would ever take place—that the committee members, being sane and reasonable people, would simply try to find out what were the misconceptions and voids in understanding that gave students trouble in statistics and then put together a meaty little eight-week course that would teach the students what they most needed to know. But I am not too confident, for it is just such people—social scientists and educators—who have engaged in identical dialogue when presented with the closely related problem of designing a preliminary program for children expected to have difficulty learning what is taught in primary school.

In the preschool programs that Siegfried Engelmann and I conduct, we have tried to approach the educational problems of disadvantaged children in the same matter-of-fact way that we think most people would approach other learning deficit problems—like the problem in teaching statistics just cited. It seemed evident that first-grade academic work, like academic work at any other level, has certain prerequisites; and it was also apparent that disadvantaged children were usually weak in prerequisite learnings, their weaknesses tending to lie in the areas of language and reasoning. Although there might be other factors contributing to early school failure among disadvantaged children, it seemed wise strategy to clear away the large known factor first and then see what was left.

The task of designing a remedial course for four-year-olds deficient in language and verbal reasoning proved to be much more difficult—by an order of magnitude at least—than, say, designing a remedial mathematics course for statistics students. The difference is not in the pupils but in the state of the art. Whereas the mathematical requirements of a given statistics course are fairly evident, the requirements of primary-grade instruction in terms of the kinds of statements and reasoning operations a child is expected to grasp are not instantly derivable from a knowledge of what content is presented. Whereas mathematics has been taught for centuries, so that for any given topic there is a goodly supply of methods and materials available, the prerequisites for first grade—whatever they might be—have not been deliberately taught in the past. The child has been expected to learn them at home in some unspecified way. Finally, whereas graduate students have been taught things for as long as there have been graduate students, the deliberate teaching of anything very definite to children below the age of five has been a rarity in schools and virtually unheard of with children from underprivileged homes. In fact, there seemed to be a widespread belief among professional child lovers that it would be impossible or ruinous to the children.

But here is the key point: Although the task of designing such a remedial program for preschool children was more difficult than that of designing other kinds of remedial education for older students, there did not seem to be any reason for putting it on a different conceptual basis. We were mystified that other people working in the area seemed to act as if no analogous problems had ever been dealt with before, and were running off widely and wildly in search of theories to give them some guidance. Faculty psychology was reborn and many people began advocating mental exercises, under the banner of "stimulating psychological processes." Others turned to Piaget who, by offering a theory that managed to deal with learning independently of teaching and cultural transmission, made it possible for them to ignore cultural deprivation altogether, while conjuring up interesting possibilities. Everyone seemed to be avoiding the difficult task of deciding what, specifically, disadvantaged children needed to learn and how it could be taught to them.

DEVELOPMENT OF A BEGINNING LANGUAGE PROGRAM

The problems in planning a short-term compensatory educational program are of an earthly sort. Had the mythical committee I introduced at the beginning of this paper stayed off the mushrooms for a while,

they would eventually have gotten around to considering problems such as these:

1. The mathematical learning which the disadvantaged graduate students have missed out on normally occurs over several semesters of work. Since that much time is not available, it will not do simply to imitate the educational histories of the more privileged students.
2. An inventory of all the things it would be useful for the students to know would be unmanageable. How assign priorities and, especially, how distinguish the necessary from the merely desirable?
3. Assuming that it is out of the question to give students the foundations of mathematical reasoning in so short a time, how does one impart some understanding to them and not just rote memorization?
4. Sophisticated people may well overlook many of the more troublesome misunderstandings of the students because they involve things that have been second nature to the sophisticated person for years. (For instance, it might never occur to a teacher that some students didn't realize subscript numerals served only as identification tags and didn't count as numbers in computation.)

The same or very similar problems occur in planning a program to prepare disadvantaged children for the verbal demands of primary school. Middle-class children learn what they learn about using language through years of informal interaction with literate adults; but even though that method of language learning seems to work fine, something much quicker has to be discovered if the same results are to be achieved in a few hundred hours. The second problem, the assigning of priorities, is especially perplexing in this case. There is so much to language—so many aspects and so much detail—that it seems presumptuous to pick out some things as vital and let the rest go. Analogous to the third point above is the fact that concepts in a first language can't be explained verbally to the learner, and so understanding must be achieved through some other means. Finally, for an adult to anticipate or detect the misconceptions and sources of difficulties, the wrong turns and pitfalls that occur in a child's learning of language and thinking rules, is an unbelievably tricky task.

The first two problems—accomplishing more in less time and assigning priorities—are at once the most difficult and the most critical problems. With only one or two exceptions those experimenters who have developed language programs for disadvantaged children have dealt with these two problems by ignoring them. They have adhered closely to nature's way, relying on informal conversational interchanges to do the job of language teaching and have left the selection of content to chance.

The language program we have used was originated by my colleague, Siegfried Engelmann. His outstanding achievement in this program, I believe, is a bold simultaneous solution to the problem of time, and the problem of priorities. As Engelmann saw it, the child's primary need was for a language that would enable him to be taught. Once the child had that, you could go on and teach him anything else you pleased. Such a language did not have to be distilled from a recording of actual verbal behavior but could be constructed, much as Basic English was constructed, by a consideration of the needs it had to serve. Such a language could be taught to children in a relatively short time (in practice, two to six months), and it would then be possible to add the refinements of complete English and also to teach other things in a more direct and normal manner.

Teaching disadvantaged children a miniature language that someone else has made up for them may sound a bit 1984ish to the doubters among us; but realize that it is regular English, just a stripped-down version of it, and that the principle of starting with a miniature system which is part of, but more easily grasped than, the entire system is a respectable and widely used pedagogical device. Methods of reading instruction that begin with a limited vocabulary that follows a few consistent spelling rules are an example, as are physics lessons that begin with consideration of a homogeneous frictionless environment.

To describe the basic language program briefly, it presumes nothing more of the child at the outset than that he be capable of making some attempt at imitating what is said to him. Only two basic-statement forms are taught, the first being the identity statment, "This is a _____," and "This is not a _____." Once this statement type is mastered (and mastery of the not-statement is a major challenge to many seriously deprived children), the remainder of the beginning language program is devoted to work with the statement form, "This _____ is _____," with its negative and plural variations, introducing several different kinds of concepts that are used in the predicates of these statements: polar sets (big-little, hot-cold, and so on); nonpolar sets, such as the colors and prepositional phrases; and subclass nouns, as in "This animal is a tiger."

Once the basic system has been mastered, it has been found possible to move very rapidly with almost all children through the expansion of the system to include active verbs, the common tenses, and personal pronouns. The remainder of the language program is devoted largely to if-then type statements in which the major problems are logical ones concerning the use of *all, only, some, and,* and *or.* The program, thus, culminates in the use of language for deductive reasoning, all of the more elementary work with statement forms and concept

types having been designed to provide the groundwork for this use of language.

The problem of teaching generalizable rules, given that the children cannot understand most explanations, is handled through the use of a kind of pattern drill in which, by repeated application of a form like, "This _____ is not red," they learn through correction where and and on what basis it applies. This is learning rules by analogy, and so to make it work the entire program is structured so as to dramatize significant analogies as much as possible. Rather than grouping concepts on the basis of their thematic associations (concepts related to the school, to the zoo, and so on), they are grouped together on the basis of the rules governing their manipulation. Thus polar sets of diverse content (big-little, hot-cold, boy-girl) are taught as part of a single sequence, so that the child may eventually come to grasp the major principle governing such sets—the principle that saying that something is not one member of the set is equivalent to saying that it is the other member of the set.

The actual teaching consists mainly of variations on five basic "moves":

1. Verbatim repetition:

TEACHER: This block is red. Say it . . .
CHILDREN: This block is red.

2. Yes-no questions:

TEACHER: Is this block red?
CHILDREN: No, this block is not red.

3. Location tasks:

TEACHER: Show me a block that is red.
CHILDREN: This block is red.

4. Statement production:

TEACHER: Tell me about this piece of chalk.
CHILDREN: This piece of chalk is red.
TEACHER: Tell me about what this piece of chalk is *not.*
CHILDREN: (ad lib) This piece of chalk is not green . . . not blue, and so on.

5. Deduction problems:

TEACHER: (with piece of chalk hidden in hand) This piece of chalk is not red. Do you know what color it is?
CHILDREN: No. Maybe it is blue . . . maybe it is yellow . . .

These moves represent a rough hierarchy of task difficulty. In the early stages of the program, large amounts of time have to be devoted to the lowest level—verbatim repetition—and deduction problems can seldom be handled. By the end of the program most of the time is devoted to deduction problems, although at each new step in the program

it is necessary to go through all of the moves, if only in very condensed form.

As the above examples suggest, the instruction is carried on in a highly disciplined manner. The pace is fast, all children are required to respond and to put forth continual effort. Guessing and thoughtlessness in responding are discouraged. With the 150 or so children who have been exposed to this kind of teaching, however, we have found few instances of difficulty in maintaining enthusiasm and effort among four- and five-year-old disadvantaged children during twenty-minutes-per-day intensive sessions. So long as the tasks are within their reach, yet difficult enough to be challenging, children seem to take to this kind of instruction very naturally, and with practically no period of breaking in.

SOME EXPERIMENTAL RESULTS

We have run two experimental preschool classes for disadvantaged children to date, both groups starting at age four. Group I consisted of fifteen Negro children coming from households that contained older children who were identified by their teachers as problem children showing effects of cultural deprivation. This group was maintained for two years, through kindergarten, and thirteen of the original children remained to the end. Group II also contained fifteen children, seven white and eight Negro, selected this time according to conventional Project Head Start standards of income and socioeconomic status. This group has had only one year of preschool.

The educational program was much the same for both groups. It consisted of two hours a day, of which three twenty-minute periods were devoted to direct instruction. The language program described in the preceding section occupied one of these periods, and the other two were used for instruction in reading and arithmetic. I will not attempt to describe the latter curricula here.[2] They were similar in conception to the language program—highly verbal, with great emphasis on the learning of generalizable rules through practice on analogous tasks, and embodying as much as possible the principle of minimizing rule complexity and irregularity at the beginning. The other hour of the day was occupied with more informal activities—singing, stories, drawing, and printing—which were nevertheless planned to reinforce the content of the formal instruction. During the second year, for Group

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[2] All three curricula are presented in full in *Teaching Disadvantaged Children in the Preschool* by Carl Bereiter and Siegfried Englemann (Englewood Cliffs, N. J.: Prentice-Hall, 1966).

I, instruction in basic language gave way to instruction in science concepts, again following the same general approach.

At this writing neither group has entered first grade, and so by the rules of scientific caution I should not make any but the most tentative claims about the program's success in achieving its stated objective—of enabling the children to succeed in primary school. I am, in fact, extremely reluctant to make any claims on the basis of improved psychological test scores, because I don't know of any evidence to show that experimentally induced gains on predictors of academic achievement have any predictive validity themselves.

However, with Group I, who have completed kindergarten, it is possible to claim that a fair number of them have already succeeded, or partly so, in the first grade, by virtue of having already gotten over the most critical hurdles of that grade. On the Wide-Range Achievement Test, ten of the thirteen children in Group I scored at or above the 1.9 grade level in arithmetic (the normal level expected to be attained at the end of first grade). The mean-grade level was 2.6, the lowest, 1.4. In reading, the average was 1.5, three children scoring at 1.9 or above, and only one scoring below 1.0. In spelling, the average was 1.7, with six children scoring at 1.9 or above and the lowest scoring at a grade level of 1.2.

Achievement was notably higher in arithmetic than in reading and spelling. This could easily be passed off as indicating the relatively greater influence of language handicaps on reading than on arithmetic, but that would be begging the question. We are not satisfied that we have yet pinned down what, in particular, disadvantaged children need to be taught that will enable them to catch on to reading more rapidly. The literature is full of suggestions by people who don't know, either. We believe we are on to some important improvements, however, through ideas gained from a comparison of the response of middle-class and lower-class four-year-olds to reading programs using the same introductory approach—a comparison which ended after seven months with the lower-class children scoring at the 1.2 grade level in reading and the middle-class children scoring at 2.4.

In all, however, we have been very gratified by the academic achievements of the disadvantaged children, none of which, incidentally, is achieved by rote memory. The children are not taught multiplication "facts," and so forth, nor are they taught to read or spell words by memory (except for a few high-frequency impossibles like *the*). They are taught to figure these things out. And in doing so they display the verve, agility, and persistence that would ordinarily signal an IQ in the superior range. Thus it is interesting to note that the Stanford-Binet IQs of Group I, although they rose from a mean of 95 (obtained six weeks after the beginning of school) to 105 at the end of kindergarten, do

not presage anything more than average performance for their age. The highest final IQs are a 126, earned by a middling performer, and a 117 held by the next-to-lowest achiever. The four all-around highest achievers, who scored at the 1.9 grade level or higher in all three achievement areas, had IQs of 99, 100, 107, and 114.

In Group II, which has completed only its first year of preschool, the IQs rose much more dramatically, from 95 to 112. Yet their achievement-test scores, while quite satisfactory (averaging between 1.1 and 1.2 on all tests), are no better than the first-year scores of Group I, who at that time had a mean IQ of only 102.

What about control groups? We are always a little taken aback when someone who has just watched a kindergarten class solve a page full of linear equations suggests that perhaps disadvantaged children who spent their time playing dress-up in front of a mirror could do just as well. Nevertheless, we do have some comparative data on achievement, which is summarized in Table 9.1.

Group I, the group that has finished kindergarten, is not strictly comparable with any other group. Group II, however, was selected as part of a randomized block-design that included Groups C_1 and C_2 as well and was controlled for IQ, socioeconomic status, and race. Group C_1 consisted of two classes that were given an intensive instructional program, but one that used a variety of educational games rather than sequential teaching. Group C_2 consisted of two other classes that followed a traditional nursery school program. All three groups had the same amount of schooling and the same pupil-teacher ratio of five-to-one. Group II is significantly superior to Group C_2 on all tests and to Group C_1 on everything but arithmetic. This is not so surprising, since the approach taken to arithmetic is one that bears most

TABLE 9.1

Mean Grade-Level Scores on Wide-Range Achievement Test

Group	*Age*	*Years in School*	*N*	*Achievement Scores*		
				Reading	*Arithmetic*	*Spelling*
I	5–6	2	13	1.5	2.6	1.7
II	4–5	1	15	1.2	1.1	1.2
C_1	4–5	1	26	0.7	0.9	0.8
C_2	4–5	1	26	0.4	0.6	0.6
Ac	4–5	1	18	2.4	1.5	1.7
M	4–5	2	17	1.0	1.2	1.2

of its conventionally measurable fruit in the second year. The first year is highly formal and it is only after the children have acquired sufficient language mastery that an attempt is made to teach them to translate between everyday language statements and mathematical statements.

Groups Ac and M are comparable groups of middle-class children of mostly college-educated parents. Group Ac received instruction paralleling that of the disadvantaged Group II, while Group M attended a private Montessori school, most of them for their second year. The achievement scores of Group M are very similar to those of Group II, whereas Group Ac is significantly superior in all areas to all the other prekindergarten groups. Its scores are more like those of Group I except for the reversal of standing on reading and arithmetic. Interestingly, the distribution of spelling scores for middle-class Group Ac and disadvantaged Group I was almost identical; they attacked the words in the same way and made the same mistakes.

HOW DO YOU KNOW THEY'RE ANY SMARTER?

There is one line of response to our preschool program which goes, "All right, so they can add and subtract and read a little. But how do you know they're any smarter than they were before?" This is one of those naive questions that hits a profound point.

The same question could be asked of any preschool program: "All right, the children have learned to fit cuisenaire rods together (or solve alphabet puzzles, or arrange objects according to size, or carry on conversations with a puppet)—but how do you know they're any smarter than they were before?"

There is no satisfactory answer in any case. It does no good to appeal to IQ gains. They merely indicate that the children have also learned to answer some questions on an intelligence test. The most formidable theoretical claims topple before this question. "All right, so the children have acquired conservation of substance. But how do you know . . .?" Alas, Piaget never said a child would become any smarter for having been taught how to pass one of his tests—and if he had said so, someone could have asked him how he knew.

The question, then, is unanswerable and must ultimately be rejected. But what it does is strip away all superfluous claims, leaving only the bald declarative, "All right, we taught them such-and-such." There is nothing left but to defend what was taught as being useful. This, as I see it, is the sensible starting point for compensatory education.