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AUTHOR Anderson, Scarvia B.  
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ABSTRACT

This report, addressed to graduate students who intend to enter into field research in inner-city settings, details some of the personnel and community relations problems and logistical and financial challenges encountered by a research team, which undertook an evaluation of early education programs, basic research on child development, and social action. Hiring community workers for local management and data collection was found to present problems. The evaluation staff underestimated demands placed on the local coordinator, whose loyalty was divided between the community and the project. Delays in bimonthly pay checks created serious hardships, and were responsible for absenteeism among black mothers hired as testers. Chaos and violence in these women's lives were noted to affect their work. Securing adequate office space, transportation and communication facilities, children's furniture, estimation of petty cash needs, and the establishment of trust between the project evaluation staff and the community are other problem areas discussed.  
(KG)

Dr. E. Gordon  
3/6/70

FROM TEXTBOOKS TO REALITY: Social Researchers Face the Facts  
of Life in the World of the Disadvantaged\*

Scarvia B. Anderson  
Educational Testing Service

Of Lowe's 40-year project to develop a palaeographical guide to all extant Latin literary manuscripts copied before the ninth century, John (1969) wrote:

If Lowe's project [Codices Latini Antiquiores] had initially been proposed in words that would now accurately describe how it was actually carried out, there is no question that its chances of avoiding miscarriage would have seemed negligible at best. No prudent man, entrusted with a foundation's funds, could have bet them on C. L. A.

It is no small comfort to read of the history of some major researches in other disciplines (which, since they are not our own, always appear more distinguished) when one is embarking on a project that eminent advisers have said could not be done. Fortunately, for the dedicated investigators, two agencies (Head Start\*\* and Educational Testing Service) were willing to place some bets on a "longitudinal study of disadvantaged children and their first school experiences." But it is certainly true that the words in the original proposal did not provide a very accurate description of what carrying out this study would be like. Furthermore, with less than two of a planned six years of data collection behind us, we are still a long way from solving many of the practical--not to mention theoretical--problems associated with this kind of research related to social action.

Nevertheless, this paper will detail some of the personnel, community relations, and logistical challenges of the study and the means we have adopted to face them. The spirit is not so much that of an Apologia (see Schachter et al., 1961) or a revelation to graduate students of the prologues and "sediment" in educational research (Wittrock, 1969), as it is an interim progress report specific to one of the stated

\* I am indebted to Samuel Barnett, Joseph Boyd, Virginia Shipman, George Temp, Virginia Wilson, and Jane Wirsig for suggestions about this chapter.

\*\* Originally Head Start/OEO, then Head Start/Office of Child Development/HEW.

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aims of the study: to learn how to do research of this kind in this kind of setting. At the same time, we shall be grateful if an occasional section enables a colleague to avoid a pitfall in his own social research or at least to feel some comfort of fellowship.

First, let us take a look at the study as a whole. It is a longitudinal study of children from the age of about 3 1/2 (before preschool) through grade 3. The present sample size is 1700, but some of these children will move and be unfindable, and the design allows us to add children who move into the preschool and school classes of children in the original sample. Thus, over the period of the study we expect we will be in touch with well over 2000 children but, of these, only about half will be veterans of a complete six years of measurement. Most of the children are from poor families; the majority of them are black. (Fortunately, the two are not completely confounded.) The children are from Lee County (including the city of Auburn), Alabama; Portland, Oregon; Trenton, New Jersey; and St. Louis, Missouri. Even brief visits to those four spots point up the lack of standardization of the term "disadvantaged."

The object of the investigation is to try to identify the components of early education that are associated with cognitive and personal-social development of children--and the family and community characteristics that may moderate these associations. In other words, it is evaluation of early education programs (especially Head Start), basic research on child development, social action, and a "practicum" in how to do research in the real world. It relies upon a naturalistic design: the sample includes all children in selected school districts who will be eligible to enter the first grade in the fall of 1971; some of them have enrolled in Head Start and others have not. We have managed to convince ourselves that this is the best design for the study purposes, just as we have managed to live with a number of other compromises with "elegance." For example, our first choice eastern city became ineligible at the last moment (their Head Start funds were cut off), and we had to change our whole rationale for the "purposive" sampling of cities. (For a more complete description of the study, see Educational Testing Service, 1968 and 1969, and Anderson & Doppelt, 1969.)

Local personnel. Very early in the study plans, we committed ourselves to using community people (mostly those described euphemistically

as "indigenous") for local management and data collection. This commitment was less altruistic than practical and professional. We needed community acceptance to do the study at all, and we felt that local people had a better chance than outsiders of collecting valid data from children, their families, and community sources. At this point we are, unscientifically, unwilling to brook any debate on this commitment.

In each site we first employed a local coordinator. The qualifications listed for this job included familiarity with the power structure in the community and rapport with the diverse elements of it; ability to speak well and fluently; involvement with disadvantaged children, their families, and early education; administrative skills; good health; and ability to drive a car. It can be seen that at the earliest stages of operations we were most concerned about community relationships. Local coordinator problems fell into three main areas:

1. We had not defined "administrative ability" very well and indeed had not anticipated the tremendous demands we would make upon the coordinators. Each one wound up with a set of personnel, fiscal, and other administrative responsibilities comparable to those of the manager of a small factory. In addition, of course, they had the other full time job of keeping up with the children and creating a favorable image for the whole range of activities. With the bias in our selection process, it is not surprising that the local coordinators did far better at the second kind of work than at the first. We belatedly arranged for some specific management training sessions for the coordinators, sessions more typical of industry than of a research agency. In addition, we have put a great deal of effort into improving the forms and instructions we provide to aid them in dealing with payrolls, inventories of equipment and materials, purchasing, personnel problems, etc.

2. Not only did we err in underemphasizing management aspects of coordinators' jobs, but also we did not foresee adequately the conceptual problems they would face. Originally, we had thought that local coordinators could be present at all training sessions for testers and interviewers, that they would learn the tasks, and that they could then exercise general supervision over the collection

of data in the field (with some monitoring from ETS of course). But the coordinators had more than enough to do without this; furthermore, effective monitoring of the technical aspects of data collection simply could not be done on the basis of brief training. Without a fund of basic knowledge about measurement and child development, they could not be expected to make adjustments or adaptations that would maintain the integrity of the study. Therefore, last year we kept ETS Princeton and regional office professional staff in the field constantly. This year we are trying something new: a technical director in each community, who is a member of a local university faculty in education or psychology and was able to arrange a limited teaching schedule. Technical directors came to Princeton for intensive training specific to the data collection of the study and are now supervising local training and data collection activities, relieving the local coordinators in principle as well as in fact of concerns here.

3. The third and greatest problem, more evident in some situations than in others, arose from conflict in the coordinator's loyalties. He\* had been hired primarily because he related well to his community. It should not have been surprising then that he would sometimes put project concerns below community concerns and pressures; for example, the purpose of the project was perceived more as providing jobs than as collecting data. We were very self-conscious about this problem at the beginning and spent more time talking around it than in confronting it directly. As one consequence, a serious rift developed in the project staff back home, and, most unfortunately, different interpretations and instructions about a situation were sometimes communicated to the local coordinators. The situation is substantially better today, partly because the staff worked conscientiously to "heal itself" and some social-professional compromises were effected, partly because the study has become fairly well accepted in the communities, and partly because the coordinators have become more knowledgeable about the purposes of the study and less distrustful of its management.

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\* "He" is used generically. Actually, two of the four coordinators are female. (Three are black and one is white.)

In each site, the local coordinators recruited local people to serve as testers. These women, mostly black, were trained to administer Hess-Shipman mother-child interaction tasks and one of the three test batteries. Training generally took six to eight weeks, much longer than we had hoped it would require. But the problems of and with the testers, as continuing association with them revealed, were related only tangentially to their abilities to learn new tasks and cope with a type of work that almost anyone would find unusual. Problems stemmed from a deeper source, a life style characterized by economic chaos, lack of personal support and back-up resources, short-term plans and expectancies, violence, and deep distrust of outsiders. Unfortunately, at the beginning of the association some of the actions that the home office took, or delayed, did not do much to dissipate this distrust.

Consider, for example, the matter of pay. ETS Princeton and regional office personnel are paid twice a month. Because of the unusual arrangements surrounding employment of personnel in the field, the first paychecks of testers were delayed even beyond the first two weeks of employment as trainees. Many of these women simply had no alternative means of sustaining themselves during this period. How were they going to buy groceries at the cash-and-carry market? How were they going to pay their baby sitters who demanded a few dollars each evening? It was shocking and understandable that the second time pay was delayed in one site (this time because the local coordinator did not get the payroll in) the testers went on strike. It took all the persuasive abilities of our coordinator of community activities to get them back to testing children again. Only a few of us who remembered the Depression were not surprised when the testers in St. Louis asked that "graduation" (a diploma-awarding ceremony marking the completion of training) be delayed a month so that they could buy or make new dresses. As one member of the staff put it, some of the needs of the testers were those of the daily maid: transportation, lunch (for some centers in Lee County there might not be a restaurant for miles), and pay by the day. We were able to furnish the first in most cases and make provision for the second. However, our accounting system could never be adjusted to allow for pay more frequently than twice a month. Gradually, and with

several pay periods behind them, most of the women began to adjust to this fact of organizational life.

In the larger cities, the majority of the testers are divorced, widowed, or separated from their husbands; they frequently have several children to support. A number are involved in some kind of court litigation. There is a general atmosphere of violence around them. (One of our interviewers discovered a murder; shots were fired at one of our rented vehicles.) Some of the women have been victims of burglaries or husbands (ex- or otherwise) on a rampage. These angry men have in several cases appeared right at a testing center; and, at least once, we reassigned a tester to another center where her husband would not be likely to find her. Usually, however, the project staff's help is not sought in such domestic matters, nor do the testers get involved in husband-wife quarrels of their friends. Calling a cop is far beyond the pale of acceptable behavior in this society.

Frequent tester absences and some turnover are associated with home problems. If a school age child gets sick, there may be no one for the mother to leave him with. The excessive absences on Mondays, far more than we would expect from regular staff, are probably attributable to another kind of home or neighborhood event. Princeton office standards of good working habits were simply not met by many of the women in the early days of the study. And some of those who met them best left to accept long-term employment elsewhere. At least the project may have helped them see that they could make it in the business or educational world. We are keeping a tabulation of what happens to our ex-testers; so far, jobs as aides in Head Start or other preschool programs seem to have held the greatest attraction. Some of our turnover losses may represent community and personal gains! Moreover, as the project continues, many field employees have continued in a number of different roles and we have been greatly encouraged by the improvements in working habits.

In our original definition of the tester job, we naturally stressed the testing per se. Then, when we asked testers to do telephoning, answer sheet inspection, or other fill-in jobs, they sometimes refused stubbornly and sullenly. Yet unless they are occupied constantly, a whole new set of problems based upon gossip and rumor emerges. The

most successful testing centers, in more ways than one, have been the busiest centers. As we have recruited new testers or started new phases of testing, we have made every attempt to communicate a broader definition of the tester job and to back up this broader definition with ample "seat work."

At least one more tester problem should be mentioned, but this one is not particular to the group of data collectors we used. It is certainly familiar to other researchers using any relatively untrained child testers. One of the hardest parts of the training was to make the testers assume roles different from those they might play with their own children; good testers, unlike good mothers, are neither teachers nor disciplinarians.

In spite of all the problems, however, most of the women have been very proud of their jobs and their "diplomas." (Many of them had never received a diploma for anything before.) And, by and large, they have produced useful data on children and their mothers.

There are at least three other categories of local personnel: observers who go into classrooms (usually they are drawn from the ranks of those who test at other times), playroom supervisors, and drivers.

Playroom supervisors are generally tester trainees who "flunked." In their new tasks, most of them seem to forget their earlier lack of success. They are usually motherly types with considerable skill in comforting a frightened child, making a skinned knee well, or engaging a child's interest in a toy until it is time for him to go to a testing room. They also make quantities of peanut butter and jelly sandwiches and take charge of brothers and sisters of study subjects whom the mothers bring along.

Drivers should be as carefully screened as testers. In the early days of the project, we were not as aware of this as we should have been. Fortunately, we have had a number of good drivers who defined for us what the job should be. Drivers have to be able to answer questions about the study, they have to feel responsible for their charges, they have to be prompt. There are, for example, the drivers who take children home to find no one there; they may babysit for a



while or take the children back to the testing center playroom, but they do not leave them unattended on their doorsteps. Some drivers help get Johnny or Susie dressed if they get to the house and find Mother behind schedule. Since the same driver picks up the same children on succeeding days, he gets to know them in a way that few other study personnel do.

Community relations. A major consideration in the selection of study sites was the expressed willingness of school people, Head Start people, and other community people to be involved in, or at least accept the presence of, the research. To secure these expressions of willingness, members of the central project staff and ETS regional offices made "presentations," distributed brochures, went on local radio and television programs, and had informal discussions in offices, barbershops, and cafés. Project plans call for a continuation of publicity efforts throughout the six years; and to the conventional media we have added some others that seem to be especially effective in getting our messages across: notices in church bulletins, announcements from pulpits, flyers stuck under doors, and placards in laundromats.

However, we believe that our continuation in the communities is far more dependent on local involvement in the project than on our publicity about it. We staff from the community, buy from local merchants, and maintain a highly visible office there. We have now had local offices for over a year, and we think that this fact alone has helped establish that we are not a fly-by-night organization. We are listed in the local telephone directory; local companies deliver goods to us and send us bills; increasing numbers of the citizenry call upon us with requests of one kind or another.

Generally our testing centers are set up in churches or in church-related buildings. The original reasons for this choice were convenience, low rent, and the fact that many churches have a number of small Sunday school rooms ideal for individual testing. However, we feel that the use of churches had the supplementary advantage of adding an aura of respectability and responsibility important to our initial contacts with the families of study children.

Another activity, undertaken for measurement reasons, is also important in community relations. We appointed a Communities Advisory Panel consisting of two representatives from each site, one involved in some official capacity in education (e.g., school principal) and the other a member of the concerned but not professional community (e.g., Head Start mother). In an intensive meeting with the project measurement staff, this panel reviewed all of the tests in terms of the appropriateness of the items to the socio-economic level and local conditions of the young subjects. Their comments were varied and helpful (e.g., objects might be familiar to the children of rural Lee County but not familiar to the children from St. Louis housing developments, and vice versa), and we took account of as many as we could in revising the instruments. This panel will be asked to review instruments planned for later years of the study as well.

To deny that a project such as this would have some racial overtones would be exceedingly naive. In the early days of training testers, the Trenton group was brought to the ETS Princeton office, because the Trenton office was not large enough for the total group sessions. A chance rudeness in the cafeteria line by someone not connected with the project at all led to immediate shouts of "racism." That same cry was used several times in communities too when a local employee wanted to put down an ETS professional trainer and could not seem to think of a better way to do it. During the pay strike mentioned earlier, a black staff member had to contend with charges of "Uncle Tom-ism." But the shouts seem to be dying down, and fortunately they have been directed at Princeton employees, the "establishment," rather than at co-workers in the field.

In fact, there have been practically no problems of a racial nature within the testing centers. Black and white testers have worked together amicably in Lee County and St. Louis alike; black testers comfort white children and greet their mothers; white testers work equally effectively with black and white children. At one point, when it was suggested that we might have to segregate testing centers in order to reach the children of some rural white Alabama families, the testers expressed willingness to organize themselves in this way for the sake of the study, but they were obviously unhappy about the possibility. Fortunately, ETS policy against segregated testing centers

and the feelings of the Alabama testers were congruent. Color blindness was also a matter of pride to interviewers. Although the relevant research evidence is not definitive, it was proposed that we send black interviewers to interview black mothers and white interviewers to interview white mothers. The Portland crew rebelled loudly: "What are we supposed to do," the black interviewers asked, "if a white mother answers the door? Say uh-oh, wrong color, I'll have to go get my friend?" We bowed to their demands to relax the requirement of matching interviewer and interviewee, but because of the neighborhood assignments of interviewers most of the interviews were color matched. At least that could be blamed on a larger problem of society and not on a provincial project policy. One race-related adjustment had to be made to a fact of the real world: if the driver was a black man, we sent a white tester along with him to pick up children in some predominantly white areas.

Some of the public relations problems were so subtle that it took us a very long time to find out that we had them. Even the name of the study came into question. Head Start had funded a study of "disadvantaged children and their first school experiences" but one does not walk up to a mother and say, "We want your child in our study of disadvantaged children." On all local communications we try to remember to drop the word "disadvantaged." We even have to be careful in referring to the "project." Some mothers in Trenton put our project in the same category as "housing projects" and "poverty projects" that they did not want to be associated with. We have a token payment for mothers, but we have to be careful not to appear condescending as we present it. We also have to be careful about who our local friends are or, more specifically, we have to try to be friends with everyone and not get identified with one particular group no matter how helpful they are. In one city, we got caught right in the middle of internecine warfare between two settlement houses.

Logistics. Getting an operation going requires trained personnel, facilities, materials/equipment, transportation/communication, and specified operating procedures. There were times in the early days of the project when many of us wished we had had more courses in business administration if fewer in the social sciences.

Before personnel training got underway, we rented and equipped offices. Finding a suitable site in a short time was especially difficult in the impacted areas of Trenton and St. Louis. In our target areas in St. Louis, if an office has been vacant for any length of time it is likely to have been so vandalized that it will require a major restoration effort. We have "made do" there with very inadequate space and are only now moving into suitable quarters. Beyond locating space, we had to equip our new rented offices with everything: window shades, used furniture, typewriters, \$29.95 copying machines, wastebaskets, rubber bands, paper clips, stationery, etc., etc. In keeping with our general policy, most of these items were purchased locally, and serendipitously we usually saved money by doing it that way. (The project is operating under a grant that is relatively very large for educational research. However, we are trying to do so many things that--not unlike our testers--we seem always to be teetering on the brink of fiscal disaster.)

Our testing operations were to be in churches, and generally the churches provided basic furnishings. However, several did not have child-sized furniture and in a few cases we had to build or improvise partitions to obtain enough private testing space. The testing materials were, of course, the major equipment for the centers and, with manuals, answer documents, and the other components (pictures, food, toys, etc.) of 28 different measures for 3 1/2 year old children, the task of supply was formidable. Toy departments did not yield all of the materials the psychologists had put into their tasks or, in some cases, if they had an item, it was the wrong color. At one point in the project, while tester trainees were on call, they painted a large number of toys and pictures to conform to task specifications. Unfortunately, halfway in the testing all of the paint began to rub off, but we have improved upon the procedure this year. During the course of testing, the manufacturer of Etch-a-Sketch games (used in one mother-child interaction task) seemed to be producing increasingly poorly constructed ones or else our subjects were becoming increasingly aggressive; in any case, this equipment was subject to constant replacement. The projection equipment for the fixation task was so often out of commission that we had to involve the president of the large manufacturing company in the maintenance problems. Add to the list of equipment

that seemed to be needed in testing centers in never ending supply: Tootsie Rolls and paper bags (for the delay of gratification and risk taking tasks), Polaroid film (pictures were essential to the self-concept task and also made nice souvenirs for the mothers), something more than juice and cookies for obviously unbreakfasted children (dry cereal and peanut butter were favorite menu items), coffee for waiting mothers, strong wrapping materials to return answer documents to ETS, and size 4 underpants (even the best trained children sometimes needed extras in the excitement of the new situation).

Safeguarding equipment in both offices and testing centers is a matter of serious concern to local coordinators. They need money but they are actually fearful of having it around, and locked metal boxes provide a relatively poor solution. Travelers checks are a somewhat better one. After two air conditioners were stolen from our office in Trenton we started renting a dog for nights and weekends. A continuing series of "losses" of small, readily negotiable equipment in one site was a clue to a drug problem.

We expected to provide transportation for mothers and children to the testing centers, but at first we offered parents the option of "own" transportation versus ours. However, at least two of our coordinators noted that the "no shows" were significantly greater for the "own" transportation group, and we started insisting that we would handle transportation arrangements. Last year, transportation was provided in rented station wagons. This year, we are the proud owners of eight small vans. The reasons: ownership is more economical in the long run, and the vans provide the flexibility of an extra testing room if needed.

Establishing policies and procedures for field operations was and is not easy. The two most troublesome areas, not unexpectedly, have been personnel and finances. Some of the problems have been related to attempts to integrate field and central office procedures.

The problem of semi-monthly pay periods has already been mentioned. This arrangement is satisfactory for ETS Princeton and regional office employees; it is far less satisfactory in the field. However, a dual system would require a major and very expensive change in ETS accounting

procedures. Part of the reason for the initial delay in pay checks to testers in the field was that legal authorities were puzzling over whether testers should be considered "temporary employees" or "consultants." Initially, we explained their jobs to them in terms of the latter (this meant to them that we did not take out social security and federal income tax). However, we had to go back later and explain that all procedures had been changed: they would be considered temporary employees. (That status, incidentally, is a factor, along with personal characteristics, in the turnover problem mentioned earlier. Despite the fact that we are thinking of a six year study, our budgets are handled on an annual basis. Furthermore, we cannot guarantee full-time work within the year. More permanent jobs are bound to be attractive.)

Then there were the problems of setting up cash resources for local coordinators to enable them to cope with "start up" expenses. Charge accounts are fine for dealing with large, conventional purchases. The corner dime store does not charge that suddenly needed extension cord; cash was required to take advantage of the surplus store's reasonable offering of child-sized chairs and tables; no one had quite anticipated the costs of paper cups, cookies, and juice at testing centers. But, at the time the study began, ETS policy allowed operations a maximum of \$50 in petty cash, and receipts had to be processed before replacement funds could be provided. This policy was changed for the longitudinal study, but the change could not be effected before professional trainers in the field had used up their living allowances for equipment and the local coordinators had incurred personal debts.

Personnel recruitment, hiring, and especially firing are very different propositions in Portland or St. Louis, compared to ETS Princeton. In the Princeton office with over 1300 regular employees, relatives can easily be separated departmentally; if an employee is not doing well on one job there is the opportunity to try him on another; the job market is such that one week's notice is not necessarily a catastrophe; and, most important, jobs can be classified as "regular" rather than "temporary." We are slowly evolving personnel policies that are more realistic for our new colleagues.

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We are obviously not far enough along to draw any firm conclusions about what our research thrust into the world of the disadvantaged has accomplished either for them or for us, but there are some signs in us that seem rather significant:

1. We write or say "them" and "us" much less easily, and the researchers are as likely to talk about what they have learned from the field as about what they have taught.
2. We complain more than we used to about our graduate training in psychology and education and how ill equipped it left us to work on real problems.
3. We recognize that there are deadlines more important than APA papers, and we are not as afraid as we used to be of losing our personal professional identification in the kind of projects that require a team effort.
4. After being in the position of the "establishment" for a couple of years, we have new sympathy for some of the revolts against it.
5. We have developed considerable realism about time and money: everything seems to take twice as long and cost twice as much as we expect.
6. We can even hold up our heads in the face of nonrandom assignment of subjects to treatments.

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## References

- Anderson, S.B., & Doppelt, J. (Chm.) Untangling the tangled web of education. Symposium sponsored by the National Council on Measurement in Education, New York, November 1968. Princeton, N.J. Educational Testing Service, RM-69-6, 1969.
- Educational Testing Service. Disadvantaged children and their first school experiences: Theoretical considerations and measurement strategies. Report in 2 volumes, December 1968, Contract OEO 4206 and Grant OEO CG-8256, Office of Economic Opportunity.
- Educational Testing Service. Disadvantaged children and their first school experiences: From theory to operations. August 1969, Contract OEO 4206 and Grant OEO CG-8256, Office of Economic Opportunity.
- John, J.J. E.A. Lowe and Codices Latini Antiquiores. American Council of Learned Societies Newsletter, 1969, 20 (5), 1-17.
- Schachter, S., Festinger, L., Willerman, B., & Hyman R. Emotional disruption and industrial productivity. Journal of Applied Psychology, 1961, 45, 201-213.
- Wittrock, M.C. Dirty data points: The case of the missing research equipment. Paper presented at the meeting of the American Educational Research Association, 1969, and published in Educational Researcher, 1969, 20 (9), 5-7.