ACT RESEARCH REPORT

No. 73

73

April 1978

TEACHERS ARE PSYCHOLOGISTS, TOO: ON THE APPLICATION OF PSYCHOLOGY TO EDUCATION

D. E. Hunt

PUBLISHED BY THE RESEARCH AND DEVELOPMENT DIVISION

THE AMERICAN COLLEGE TESTING PROGRAM

P. O. BOX 168, IOWA CITY, IOWA 52240

TEACHERS ARE PSYCHOLOGISTS, TOO: ON THE APPLICATION OF PSYCHOLOGY TO EDUCATION

ABSTRACT

Psychologists need to reconsider the process by which psychological ideas are applied in educational practice. Psychologists often consider only the ideal program which they are attempting to implement without acknowledging that, whether informed by their research or not, practice must keep going: teaching marches on. One reason that psychological ideas do not guide educational practice as much as they should is the failure of psychologists to take account of what is already going on in the classroom. In their day-to-day teaching, teachers "apply" their own ideas about what they think is important and how to bring it about: they are psychologists, too.

How a teacher-as-psychologist thinks may be understood by identifying both the teacher's conceptions of students, of teaching approaches, and of learning outcomes, and the interrelations among these conceptions. A variation of the Role Concept Repertory Test developed by George Kelly and other measures originally developed for the study of person perception are described to identify teachers' conceptions. Just as the teacher is a psychologist, the psychologist is a person; that is, both generate psychological ideas and are persons to be accounted for by their ideas. This "reflexivity" principle should be applied to theories as well as to communication between psychologists and teachers.

Reconsideration of the central role of the teacher in "applying" any new program or idea casts traditional research and evaluation in a different light. Instead of assuming that a program can be implemented automatically, psychologists should first investigate the process of implementation itself. Such inquiry requires a better understanding of why teachers teach, why they adopt new programs, and the like. Viewing teachers-as-psychologists and psychologists-as-persons should facilitate communication between them, improve the quality of practice, and enrich psychological theory and research.

Prepared by the Research and Development Division
The American College Testing Program

ACT, a nonprofit organization, is an Equal Opportunity Employer.

For additional copies write:
ACT Publications
The American College Testing Program
P.O. Box 168, Iowa City, Iowa 52240

(Check or money order must accompany request.) Price: $1.00
Order No. 4-7-73

TEACHERS ARE PSYCHOLOGISTS, TOO: ON THE APPLICATION OF PSYCHOLOGY TO EDUCATION

David E. Hunt[1]

> I say moreover that you make a great, a very great, mistake if you think that psychology, being the science of the mind's laws, is something from which you can deduce definite programs and schemes and methods of instruction for immediate schoolroom use. Psychology is a science, and teaching is an art; and sciences never generate arts directly out of themselves. An intermediary inventive mind must make the application, by using its originality. (James, 1899, p. 23)

The teacher's application which William James described is the most important process in understanding the relation between psychology and education. To understand this application process requires that psychologists reconsider their relation to teachers and to educational practice. As psychologists, we need first to acknowledge that whether or not it is informed by our theory and research, practice must keep going: teaching marches on. In their day-to-day teaching, teachers "apply" their own ideas about students, teaching approaches, and learning outcomes; they are psychologists, too. We psychologists must try to understand the psychology of teachers, how they think as well as how and why they teach. A good way to begin is for us to realize that just as every person is a psychologist, every psychologist is a person. In this paper I discuss how such rethinking of teachers-as-psychologists and psychologists-as-persons can be brought about, and how this new way of thinking will improve the application of psychology to educational practice by helping psychologists and teachers communicate with each other.

What Is Applied Psychology?

Since I am in the Department of Applied Psychology at the Ontario Institute for Studies in Education (OISE), I am interested in what the "applied" in applied psychology means, and how we applied psychologists are different from "non-applied" psychologists. Many psychologists think of applying psychology as applying a coat of paint: the psychologist provides the paint and the practitioner applies it. Consider for example the recent development of "teacher-proof" curriculum packages, and ask yourself what assumptions are being made about teacher competence. Application of a teacher-proof package is something like a "paint-by-numbers" kit. In contrast to the "inventive mind . . . using its originality" described by William James, the teacher is considered an incompetent painting machine which must be carefully programmed. There is nothing wrong with describing an educational program by specific step-by-step procedures, but the rationale for the teacher-proof, paint-by-numbers approach not only insults teachers but also represents a faulty conception of the relation between research and practice. As Glaser (1973) observed:

> The sequence from basic research, to applied research, to development, to practice and application on which most of us were weaned is no longer applicable if, in fact, it ever was. (p. 557)

How then can psychological theory and research adopt a more reciprocal and productive relation to educational practice? This question has received increased attention recently from many psychologists, including Glaser (1973), Argyris

---

[1]Dr. Hunt is a professor in the Department of Applied Psychology at the Ontario Institute for Studies in Education. This report is based on a paper prepared for an ACT-University of Iowa seminar held November 5, 1975, in Iowa City, Iowa.

(1975), Bass (1974), Campbell (1974), Cronbach (1975), McKeachie (1974), and Sarason (1974), among others. Some of their proposals will be considered later.

I propose to coordinate psychological theory and research reciprocally with educational practice through the use of the Behavior-Person-Environment, or B-P-E, paradigm originally formulated by Kurt Lewin (Hunt, 1975a; Hunt, 1975b; Hunt & Sullivan, 1974). The educational process is described in B-P-E terms as learning outcomes (B) resulting from the interaction of student characteristics (P) and teaching approaches (E). Through the B-P-E approach, the psychologist can attempt to understand the teacher's "inventive mind . . . using its originality" by studying how a teacher thinks about learning outcomes (B), students (P), and teaching approaches (E). The teacher's conceptions of these three B-P-E components and their interrelation can then be reciprocally related to the psychologist's conceptions of these same components. For example, the teacher's conception of learning outcomes (B) can be compared to that of the psychologist's dependent variable in a research study (B) in order to enrich both persons' conceptions and to facilitate communication between the psychologist and the teacher. Such reciprocal B-P-E analysis may also serve to provide an estimate of the potential educational relevance of a particular psychological idea or research study (Hunt & Sullivan, 1974, pp. 250-251).

Research May Not Apply

Why does research not apply to educational practice as much as it should? One reason is that educational researchers often become preoccupied with issues which are of personal interest but which have little direct bearing on what happens in schools. In a stimulating paper entitled, "What Are We Trying to Understand and Improve? Educational Research as *Leerlaufreaktion,*" Rothkopf (1973) observed:

> We have tended to forget the practical origins of science and have allowed ourselves to be dominated by overly abstract ideas that betray our goals . . . . Educational experimenters often resemble *Leerlaufreaktion* in lower animals, i.e. complex, highly integrated activities that take place despite the absence of an appropriate environmental occasion. (p. 58)

Shulman and Elstein (1974) made a similar observation:

> Educational researchers attack problems for which convenient puzzle forms exist. As evidence for this assertion, witness continuing preoccupation with studies of paired-associate learning, adjunct questioning, learning hierarchies, etc. (p. 1)

A second reason why research does not apply as much as it should is the researcher's failure to acknowledge the complexities of the process of application. Conceptualizing the process of application requires theories and concepts which are probably more complex and challenging than the theories about the ideas to be applied. Some work in this area has been begun—e.g., Sarason and his colleagues (Sarason, 1972; Reppucci & Saunders, 1974).

In their paper, "On the Risk of Appraising Non-events in Program Evaluation," Charters and Jones (1973) suggested that implementation be considered in four levels or stages: (1) institutional commitment, (2) structural context, (3) role performance (staff perspective), and (4) learning activities (student perspective). They warned that unless implementation has reached the fourth stage, the program remains a "non-event" which cannot be suitably evaluated. Goodlad and Klein (1970) observed many such "non-events" when they looked *Behind the Classroom Door* at what were supposed to be innovative programs. Charters and Jones's four-stage framework illustrates a general model for analyzing the process of applying a psychological idea to educational practice. Any such model of implementation must also consider how the teacher views the new idea in relation to the teacher's present ideas and practices.

Finally, research has fallen short in guiding practice because it has emulated the natural sciences, a trend which has led to the illusion of generalizations from the social and behavioral sciences. This illusion, or "myth of general effects" (Hunt, 1975b, p. 211), and its corollary that generalizations are "threatened" by person-environment interactions (Bracht & Glass, 1968, p. 444) must be abandoned, for as Cronbach (1975) suggested, "We need to reflect on what it means to establish empirical generalizations in which most effects are interactive" (p. 121). After reflecting on the contextual and temporal limits to "generalizations,"

Cronbach concluded with what must be regarded as a considerable change in view from his earlier writing:

> The special task of the social scientist in each generation is to pin down the contemporary facts. Beyond that, he shares with the humanistic scholar and the artist in the effort to gain insight into contemporary relationships, and to realign the culture's view of man with present realities. To know man as he is is no mean aspiration. (1975, p. 126)

Other psychologists and educational researchers who have been reference figures for objective, experimental approaches have expressed similar concerns with psychology's continuing emulation of the natural science. Even the originators of the "threats to validity" concept seem to be changing their minds. Campbell (1974) has proposed that the educational evaluators consider the anthropological approach, while Glass (1975) has described the humanistic aspects in any form of evaluation.

To be more applicable to educational practice, psychological research must therefore be based on a new paradigm which takes account of the interactive, contextual, and temporal features of the phenomena being investigated, and which is also sensitive to the nature of these phenomena as they occur in schools.

But Teaching Marches On

"Only classroom by classroom, teacher by teacher, can schooling get better." This is a major assumption made by our Matching project team in our work at OISE. It requires first that we know what happens in classrooms. As Schwab (1969) observed, however:

> At present, we do not know. My own incomplete investigations convince me that we have not the faintest reliable knowledge of how literature is taught in the high schools, or what actually goes on in science classrooms. (p. 15)

Such ignorance of classroom practice contributes to the remote nature of educational research, as Rothkopf (1973) argued in comparing it to *Leerlaufreaktion.* To counteract this, he urged:

> Better observations of what actually goes on in instructional situations are therefore needed and more detailed records of teaching and learning must be kept. (p. 58)

Despite the absence of adequate information about what goes on in classrooms, psychologists continually make sweeping generalizations about teachers. For example, Cronbach's assertion (1967) that "it is very likely that teachers overdifferentiate," is frequently quoted. This assertion is, however, followed by a sentence which is never quoted but which states that he knew of "no research on impressionistic adaptation of instruction" (p. 29) to support his assertion. It is time not only to gather more information about actual classroom practice, but also to do so in such a way as to permit better understanding of the enormous variation among the millions of teachers. Such information on variation among teachers will serve as an empirical restraint on broad assertions which commence, "Teachers are . . . ."

It may be, as Hoetker and Ahlbrand concluded in their paper on "The Persistence of Recitation" (1969), that "The studies that have been reviewed show a remarkable stability of classroom verbal behavior over the last half century" (p. 163).

However, this conclusion is very general; the "persistence of recitation" and the occurrence of "non-recitation" approaches must be considered more specifically for different teachers at different grades in different subjects. Perhaps you react to this appeal to learn more about classroom activity by observing that "it's already been done," and noting such work as Jackson's *Life in Classrooms* (1968) and the thousands of studies applying systems of interaction analysis to classroom activity. My response is that most earlier work has been either impressionistic or arbitrarily selective. When one considers the millions of hours spent in classroom activity, it is clear that any attempt must be selective. Up to now, however, researchers have described what happens in classrooms primarily either to demonstrate a method or to obtain an index to use in program evaluation. More naturalistic accounts of the phenomena as they occur in settings where no attempt is being made to "apply research" are needed. Such accounts will be valuable in their own right.

How shall we proceed to collect such information? As usual, multiple methods are preferred but not likely to be employed. Distinguishing between espoused theories of action and theories-in-use, Argyris (1975) suggested that:

> Theories-in-use are the theories of action inferred from how people actually behave (taken from video-audiotapes or other instruments that focus on collecting relatively directly observable behavior). (p. 469)

Direct observation is always desirable, but not always possible. Sheffield (1975) has used a more general approach to try to understand more about teaching in universities. Through questionnaires sent to students, he identified 23 excellent university teachers from 23 different Canadian universities. Once identified, these teachers were then asked to write their beliefs about teaching and how they go about it. Rothkopf proposed (1973) that teachers complete "course memories" which describe specifically what occurred so that the following information would become available:

> . . . what is actually covered in school, how much time is spent on each topic, or how stable such characteristics of instruction actually are within a school, from year to year, or for a single teacher. (pp. 65-66)

As teaching marches on, teachers' activities are being determined by what they think about their work, or as Shulman and Elstein (1974) noted:

> Research typically slights the problem of how teachers *think about* their pupils and instructional problems: it concentrates instead on how teachers act or perform in the classroom. (p. 1)

Therefore, we need to know more about what goes on in classrooms and what teachers think about their teaching. This latter topic will be discussed in the next two sections.

Every Person Is a Psychologist

The idea that every person is a psychologist in his interpersonal life, i.e., the person must try to understand and predict what is going on, is certainly not new. Kelly (1955) viewed "man-as-scientist" and Heider (1958) emphasized the importance of studying "common-sense psychology." Recently in their critique of "mainstream psychology," Braginsky and Braginsky (1974) have urged that more attention be given to "everyday psychology."

In introducing his book, Kelly made the following statement:

> Might not the individual man, each in his own personal way, assume more of the stature of a scientist, ever seeking to predict and control the course of events with which he is involved? Would he not have his theories, test his hypotheses, and weigh his experimental evidence? And, if so, might not the differences between the personal viewpoints of different men correspond to the differences between the theoretical points of view of different scientists? (1955, p. 5)

As Heider put it:

> The study of common-sense psychology is of value for the scientific understanding of interpersonal relations in two ways. First, since common-sense psychology guides our behavior toward other people, it is an essential part of the phenomena in which we are interested. In everyday life we form ideas about other people and about social situations. We interpret other people's actions and we predict what they will do under certain circumstances . . . . Second, the study of common-sense psychology may be of value because of the truths it contains, notwithstanding the fact that many psychologists have mistrusted and even looked down on such unschooled understanding of human behavior. For these psychologists, what one knows intuitively, what one understands through untrained reflection, offers little—at best a superficial and chaotic view of things, at worst a distortion of psychological events. (1958, p. 5)

I suggest that these approaches proposed by Kelly and Heider be applied to the psychology of teachers. Viewing teachers-as-psychologists has many advantages in addition to those suggested by Kelly and Heider.

Every Teacher Is a Psychologist

To view teachers-as-psychologists is to emphasize the importance of a teacher's personal conceptions of teaching (whether influenced or not by formal psychology) and also to remind psychologists that teachers, like themselves, are also persons. It is curious that psychologists have usually approached the psychology of teachers in a negative fashion through Hawthorne effects, novelty effects, Rosenthal effects, halo effects, etc. These biasing effects smack of the "paint-by-numbers" conception of teachers as automatic painting machines. Why not study instead why teachers teach, how they think about their teaching, what sustains them, what discourages them, how they process information, etc.? As Shulman and Elstein (1974) observed:

> An information-processing analysis would probably reveal that teachers use their expectations precisely as most people do: to interpret or evaluate the meaning of new information they receive; to anticipate the form incoming information will take, thereby reducing the need to process that information, (as when experienced readers employ context cues); or to judge the sufficiency of information received in helping make a particular judgment or decision. (pp. 51-52)

As long as Hawthorne effects and expectancy effects are lumped into "threats to validity," not only will research not apply to practice, but the questions of why teachers teach will remain unanswered. When I am asked about the Hawthorne effect's influencing our efforts to introduce some new ideas to teachers, I often say that "we take all the Hawthorne effect we can get," much to the horror of my questioner. I am only half joking because the so-called "Hawthorne effect" obscures the real question of why teachers apply new programs at all. The Hawthorne effect must be redefined in more constructive terms and differentiated into its psychological aspects: relief from boredom, attention, recognition, congruence with old ideas, etc. Obviously such a psychological recentering of the Hawthorne effect (and other similar "biases") calls into question the traditional, erroneous view of generalization that calls for objective, neutral circumstances. If the conditions were completely objective and neutral, it is doubtful that any implementation would ever occur.

If one accepts Kelly's theory of personal constructs, then a method for assessing a person's concepts is required, and the Role Concept Repertory Test, or Rep Test (Kelly, 1955, pp. 219-266) is appropriate. This sorting task consists of three steps: (1) listing a number of persons you know according to specific role title descriptions, e.g., "a person with whom you worked who was easy to get along with," so that 20 or 30 persons in your "life space" are available; (2) considering these persons three at a time by asking "Which two seem to be alike in some important way and different from the third?" and (3) describing how these two are alike. When this triadic sorting has been repeated several times, the concepts which describe the basis for sorting them form the individual's repertory of role concepts. In personal construct theory, the Rep Test is used primarily to assess conceptions of persons; however, I have adapted the Rep Test procedure to include teachers' conceptions of learning outcomes (B) and teaching approaches (E) as well as their conceptions of students (P).

For each component, the teacher first lists several persons, behaviors, or environments and then follows the Rep Test procedure. In the Person Rep Test, teachers can simply list all of their students in a particular class if this is more convenient than following role titles. The only concern is that the list of persons (students) be diverse. For the Behavior Rep Test, the teacher is asked to write several outcomes according to specific descriptions, e.g., "an unintended short-term outcome," and to describe, in concepts, the dimensions of learning which are important to him. Similarly, for the Environment Rep Test, the teacher lists several approaches, e.g., "teaching approach I use frequently"; these are then dealt with in Rep Test procedure to generate the teacher's list of important dimensions of teaching. Variations, as required, in Rep Test procedure are quite acceptable.

The aim of the Rep Test for teachers is to help them make their implicit conceptions explicit. Exploratory work with teachers in two of my classes last summer was very productive. Teachers copied each of their three lists of concepts on dittoed sheets and shared them with one another. Some found the explication of their "psychological theories" suprising and all found the exercises a valuable way to learn about themselves and one another.

Following are some B-P-E concepts used by one teacher:

Student characteristics (P)	**Teaching approaches (E)**	**Learning outcomes (B)**
Aggressive	Small group discussion	Feels more confident
Independent	Question/ answer	Draws conclusion
Withdrawn	Role playing	Shows enthusiasm

To understand a teacher-as-psychologist, one needs to learn about different aspects of the teacher's concepts: their content, how they relate to one another, and their openness to change. The basic Rep Test gives information about the content but not about the organizational structure or openness to change. After a teacher has identified his conceptions of students, outcomes, and approaches, he may try to put them in relation to one another, both for P-E ("Which approach seems to work best with this kind of student?") and E-B ("What are likely to be the outcomes from this approach?"). In both cases, the teacher is attempting to articulate his own implicit theory of matching. Assessing the openness to change of concepts is more difficult, but I have found a procedure of "forced-sorting" to be useful. After completing the basic Rep Test sorting procedure in

which two of the persons (or behaviors or environments) have been sorted together, one then tries to regroup the persons in a different pattern. For example, if 1 and 2 were originally grouped together, then one attempts to group together persons 1 and 3, and then persons 2 and 3.

Schroder, Karlins, and Phares (1973) described a comprehensive example of variations in complexity with which teachers view students. Using a specific example, they illustrated six different levels of complexity for viewing the same student: (1) categorical (only in terms of his grades), (2) unidimensional (in terms of his grades), (3) in terms of two unintegrated single dimensions (grades and mechanical interest), (4) uniconceptual thinking based on two dimensions (low grades and high mechanical interest used to generate a new dimension, "unchallenged"), (5) uniconceptual thinking based on three dimensions ("unchallenged" dimension generated from low grades, high mechanical interest, and high social interest), and (6) multiconceptual thinking (two new concepts, "unchallenged" and high social interest generated from combinations of three dimensions). The authors described how these different conceptions held by teachers would likely be related to the teachers' use of different approaches. Assessment of teacher level of complexity could be attempted through multidimensional scaling or a more elaborate version of the Rep Test.

The Schroder-Karlins-Phares example reminds us that all of the theory and method of person perception is available to study teachers-as-psychologists. For example, it might be very useful to apply the "inferential sets" proposed by Jones and Thibaut (1958) by asking which one of the three sets a teacher was likely to adopt in viewing students: situation matching, value maintenance, or causal genetic orientation? Situation matching, which is heavily evaluative, focuses on whether the person is doing the right thing; value maintenance focuses on the perceived person's relation to the perceiver as positive or negative; causal genetic orientation is more concerned with why the person is behaving as he does.

Approaches to studying teachers-as-psychologists may vary from specific concern about determinants of a particular teaching decision, as in the simulated recall method proposed by Shulman and Elstein (1974), to general approaches which attempt to characterize the nature of a teacher's epistemology, e.g., theoretical, empirical, or personal. Because of the immediacy of teaching, it is often necessary for teachers to emphasize a practical concern: "Is it working?" This practical concern is one of the concepts most frequently heard when teachers communicate with each other.

Fuller's (1969) approach to teacher concerns provides another possible avenue, as does the earlier work on teacher expectation by Brophy and Good (1974), on teacher conceptions of students (Thelen, 1967), on teachers' descriptions of their teaching (Fox & Lippitt, 1964), and, especially, on viewing teachers in developmental stages (Katz, 1972). If we are to consider teachers both as persons and as psychologists, then it makes sense to view them in relation to their stages as teachers. Katz suggested four stages: (1) survival, (2) consolidation, (3) renewal, and (4) maturity. Any psychologist who has ever worked with both pre- and in-service teacher training is well aware of the importance of taking consideration of these developmental stages. These suggestions are not intended to be comprehensive, since the study of teachers-as-psychologists extends over many areas of theory and method. Perhaps, however, these examples may give some idea of how such reconception might be approached.

Every Psychologist Is a Person

To accept that a psychologist is a person is also to accept "the peculiar role of the psychologist as both subject and object, as both the perpetrator of theory and an exemplar of that about which he theorizes" (Little, 1972, p. 97).

Theories of psychology, Little concluded, should be reflexive, that is, they should account for the psychologist who created that theory.

The considerable implications of this seemingly simple point are suggested by the following questions: How would Freud account for having developed psychoanalytic theory, through principles of that theory? How would Skinner account for his creation of behavioristic theory, through its own principles? Such analysis of the reflexivity of a theory (or of any other psychological idea propounded by a psychologist) is not only a valuable scientific exercise but also a useful experience in humility.

A more specific implication of psychologist-as-person is that we psychologists have personal constructs just as teachers and everyone else. This

fact suggests how valuable it would be for psychologists to try Rep Test approaches in order to become aware of their own conceptions of behaviors, persons, and environments. These methods may be useful from both the perspective of psychologist-as-psychologist and that of psychologist-as-person.

At whatever level the psychologist attempts to reflect on his personal concepts, he should become better able to communicate by becoming more aware of his own implicit ideas. It would also be useful if, in reflecting on his personal concepts, the psychologist could begin to describe his ideas as he might if he were an everyday person and not a psychologist. Although this may be a great deal to expect, such consideration of ourselves as "just persons" may have the side benefit of clearing away some of the psychological jargon which is such an obstacle in communicating with those who are not psychologists. Edwin Newman's recent book, *Strictly Speaking* (1974) may provide an initial sensitizing and/or humbling experience. Reading it should be followed by serious attempts to communicate more clearly. In the process, we may also clear up our thinking. In any case, such activities should facilitate communication between psychologists and teachers.

Between Psychologist and Teacher

I assume that if psychologists and teachers reconsider themselves and each other both as psychologists and as persons, the initial effects will be that psychologists will become more aware of implicit ideas and that teachers will become more explicit about their implicit ideas (Hunt, 1975c). I suggest that the psychologist should take the initiative in communication with the teacher. Interpersonal communication is like interdisciplinary coordination (Hunt, 1973) in that it requires first that one become aware of his own ideas, next that he understand the frame of reference of the person with whom he is to communicate, and finally that he adapt his ideas in terms of the other person's frame of reference (Hunt, 1970). I have referred to these latter two steps as "reading" and "flexing" in describing teachers' adaptation to students (1975c), and they apply here to the psychologist's adaptation to the teacher.

Perhaps a specific example of such "reading" and "flexing" will help. Consider the following terms which have been "translated" into educational form in what might be thought of as a "psycho-educational dictionary" (Hunt & Sullivan, 1974, p. 263).

Translating Psychological Terms into Educational Practice

Psychological idea or term	Educational translation
Matching	Meeting a student's needs
Conceptual Level	Learning style
Low CL	Student who needs structure
High CL	Student who needs less structure
Variation in structure	Teaching methods
Paragraph Completion Test	Questionnaire
Developmental perspective	Providing support for growth
CL grouping	A way to help students become more independent and increase their self-esteem

Psychologists' insights into teachers' perspectives are important not only for communication, but also for program implementation. As I have commented (1970) earlier:

> Assuming that the matching principle is sufficiently well established, it seems probable that one of the major determinants of its acceptability will be the degrée to which it is congruent with the teacher's own ideas of matching. If so, then the task of implementing a matching model should begin with an investigation of what implicit matching model the educational decision-maker is now using. From what we know of attitude change and adoption of new procedures, the proposed matching prescriptions should not be too far out of line with those held by the person implementing them. (p. 49)

Between Theory/Research and Practice

Another basic assumption made by our Matching project team at OISE is to agree with Lewin's classic statement, "There is nothing so practical as a good theory." In his stimulating paper, "The Substance and the Shadow," Bass (1974) has qualified Lewin's maxim appropriately:

> While nothing may be as practical for advancing technology (the substance) as a good scientific theory (the shadow), it is probable that nothing may be as impractical as a bad theory. The reverse is also generally true. Good technology may be a prerequisite for the advancement of a science. Bad practice can ruin potentially good science. (p. 870)

Just as some psychological ideas from psychologists are not useful, neither will every idea from teachers-as-psychologists be a good one. However, combining the views of psychologists with those of teachers is likely to make for better theory as well as better practice. Viewing teachers-as-psychologists has two other major implications. First, it forces attention on the necessity to reorient the philosophy of science underlying psychological theory and research to a system more in keeping with the legitimacy of everyday psychology. At a philosophical level, Polanyi's *Personal Knowledge* (1964), and at a psychological level, deCharms's *Personal Causation* (1968) provide helpful guides for such recentering.

Second, as implied earlier, more emphasis is needed on theories of the *process* of implementation and application. Following his penetrating analysis of educational change in *The Culture of the School and the Problem of Change* (1971), Sarason has described what amounts to the theoretical basis for a new discipline in his *The Creation of Settings and the Future Societies* (1972). In this latter book, Sarason explicitly underplays the personal, or psychological, ideas of the participants in the creation of settings. It would seem that some of the present notions which emphasize the *psychological* aspects of the change process might be combined with Sarason's primary emphasis on cultural, sociological, and organizational analysis. Two of Sarason's colleagues, Reppucci and Saunders (1974), have extended the creations-of-settings analysis by specifying eight problems encountered in attempting to implement a program in a natural setting. For example, in discussing the "problem of two populations" (p. 654), they refer to the first population as the training agents who will implement the program (in this case, treatment workers attempting to implement a behavior modification program in a residential treatment institution for delinquent boys); the second population consists of the boys in the program. Although we usually think primarily of the "second population" in our theories, Reppucci and Saunders emphasized that the problems encountered in "applying the program" are very considerable. For example, they referred to the "problem of language" (p. 652), in which the training agents found the basic term, "behavior modification" objectionable, and so the researchers "translated" (as I described in the preceding section) the term to "social learning." All of the problems so clearly delineated by these authors require the attention of a theory of application and change.

The "problem of the two populations" also occurs in many educational research studies in the form of initiating, or bringing about the occurrence of the "independent variable." In the past we have tended to design research on the effects of teaching with little thought about the practical issues of creating the occurrence of such teaching. Because our thinking about research design comes from the natural sciences where the independent variable can be more easily controlled and manipulated, we have underestimated the importance of this "first population" and have usually referred to such problems as "threats." Snow's recent (1974) comments about research on teaching exemplify the beginning phases of the acknowledgment that variations among teachers and teaching styles are not "threats" but the phenomena to be studied. Snow observed that in some research designs, "the teacher will compromise the design, or they will strain unnaturally to conform to it, or both" (p. 282).

He continued with a very important conclusion:

> But teacher and method are confounded in nature, and there will be time enough to unravel the mechanisms involved once the effective combinations are found. (pp. 282-283)

Accepting the variation among teachers in their preferred styles and in other characteristics is important not only for the design of educational research but also for evaluation. The nature of the specific teachers in a program, their experience, preferred teaching style, attitude to the program, and other characteristics must be built into evaluation efforts. Up to now, the most important ingredient in a program, the teacher who is implementing it, has received little attention. This is one of the reasons for the failure to generalize the results of program effects. Such consideration may mean that a major portion of educational evaluation will consist of case studies or anthropological observation, as Campbell suggested. In either case, explicit attention should be devoted to the characteristics of the teachers in the program.

Between Psychology and Education

I believe that the B-P-E paradigm, when extended to include the perspectives of teachers as well as of theorists and researchers, promises to provide a reciprocal framework for facilitating the relation between psychology and education. More specifically, if teachers are considered as psychologists and psychologists as persons, these views should:

1. Help both psychologists and teachers to understand themselves and each other in a more human, productive way
2. Help psychologists and teachers to communicate with one another in a reciprocal way
3. Improve both the nature of educational practice and the quality of psychological theory and research through reciprocal stimulation

I began with a quotation from William James's *Talks to Teachers.* I conclude with an excerpt from a term paper written by a teacher in one of my classes:

> The intuitive nature of most of the conclusions of teachers is enhanced by empirical studies of psychology, and gives teachers another "way" into the complexity of the learning process. At times, the results of considering education from this perspective are surprising and unsettling, but necessarily so. For if education is to improve that improvement must begin with more meaningful and valid interaction in the classroom. (DiNoble, 1975, p.14)

References

Argyris, C. Dangers in applying results from experimental social psychology. *American Psychologist*, 1975, **30**, 469-485.

Bass, B. M. The substance and the shadow. *American Psychologist*, 1974, **29**, 870-886.

Bracht, G. H., & Glass, G. V. The external validity of experiments. *American Educational Research Journal*, 1968, 5, 437-474.

Braginsky, D. D., & Braginsky, B. M. *Mainstream psychology: A critique.* New York: Holt, Rinehart, and Winston, 1974.

Brophy, J. E., & Good, T. L. *Teacher-student relationships: Causes and consequences.* New York: Holt, Rinehart, and Winston, 1974.

Campbell, D. T. Qualitative knowing in action research. Kurt Lewin Memorial address to American Psychological Association, New Orleans, 1974.

Charters, W. W., & Jones, J. E. On the risk of appraising non-events in program evaluation. *Educational Researcher*, 1973, **2** (November), 5-7.

Cronbach, L. J. How can instruction be adapted to individual differences. In R. M. Gagne (Ed.), *Learning and individual differences.* New York: Macmillan, 1967.

Cronbach, L. J. Beyond the two disciplines of scientific psychology. *American Psychologist,* 1975, **30**, 116-127.

deCharms, R. *Personal causation: The internal affective determinants of behavior.* New York: Academic Press, 1968.

DiNoble, A. F. My assumptions about learning and B-P-E analysis. Term paper for course 1200X, Ontario Institute for Studies in Education, Summer, 1975.

Fox, R. S., & Lippitt, R. The innovation of classroom mental health practices. In M. B. Miles (Ed.), *Innovation in education.* New York: Columbia University, Teachers College, 1964.

Fuller, F. F. Concerns of teachers: A developmental conceptualization. *American Educational Research Journal,* 1969, **6**, 207-226.

Glaser, R. Educational psychology and education. *American Psychologist,* 1973, **28**, 557-566.

Glass, G. V. A paradox about excellence of schools and the people in them. *Education Researcher,* 1975, **4** (March), 9-13.

Goodlad, J., & Klein, M. F. *Behind the classroom door.* Worthington: Charles A. Jones Publishing Co., 1970.

Heider, F. *The psychology of interpersonal relations.* New York: Wiley, 1958.

Hoetker, J., & Ahlbrand, W. F. The persistence of recitation. *American Journal of Educational Research,* 1969, **6**, 145-167.

Hunt, D. E. Adaptability in interpersonal communication among training agents. *Merrill-Palmer Quarterly,* 1970, **16**, 325-344.

Hunt, D. E. *Matching models in education.* Toronto: OISE, 1971.

Hunt, D. E. Education for interdisciplinary understanding. *Behavioral and Social Science Teacher,* 1973, **1**, 16-23.

Hunt, D. E. The B-P-E paradigm in theory, research, and practice. *Canadian Psychological Review,* 1975, **16**, 185-197. (a)

Hunt, D. E. Person-environment interaction: A challenge found wanting before it was tried. *Review of Educational Research,* 1975, **45**, 209-230. (b)

Hunt, D. E. Teachers' adaptation to student: From implicit to explicit matching. Stanford Center for Research and Development in Teaching Monograph, 1975. (c)

Hunt, D. E., & Sullivan, E. V. *Between psychology and education.* Glencoe, Ill.: Dryden, 1974.

Jackson, P. W. *Life in classrooms.* New York: Holt, Rinehart, and Winston, 1968.

James, W. *Talks to teachers.* New York: Dover, 1899 (republished: New York: Norton, 1958).

Jones, E. E., & Thibaut, J. W. Interaction goals and bases of inference in interpersonal perception. In R. Taguiri & L. Petrullo (Eds.), *Person perception and interpersonal behavior.* Stanford, Calif.: Stanford University Press, 1958.

Katz, L. G. Developmental stages of preschool teachers. *The Elementary School Journal,* 1972, October, 50-54.

Kelly, G. A. *The psychology of personal constructs* (Vol. 1). New York: Norton, 1955.

Little, B. R. Psychological man as scientist, humanist, and specialist. *Journal of Experimental Research in Personality,* 1972, **6**, 95-118.

McKeachie, W. Instructional psychology. *Annual Review of Psychology,* 1974, **25**, 161-194.

Newman, E. *Strictly speaking.* Indianapolis: Bobbs Merrill, 1974.

Polanyi, M. *Personal knowledge: Towards a post critical philosophy.* New York: Harper and Row, 1964.

Reppucci, N. D., & Saunders, J. T. Social psychology of behavior modification. *American Psychologist,* 1974, **29**, 649-660.

Rothkopf, E. Z. What are we trying to understand and improve? Educational research as *Leerlaufreaktion*. *Educational Psychologist*, 1973, **10**, 58-66.

Sarason, S. B. *The culture of the school and the problem of change*. Boston: Allyn & Bacon, 1971.

Sarason, S. B. *The creation of settings and the future societies*. San Francisco: Jossey-Bass, 1972.

Sarason, S. B. *The psychological sense of community: Prospects for a community psychology*. San Fransicso: Jossey-Bass, 1974.

Schroder, H. M., Karlins, M., & Phares, J. *Education for freedom*. New York: Wiley, 1973.

Schwab, J. J. The practical: A language for curriculum. *School Review*, 1969, **77**, 1-23.

Sheffield, E. F. (Ed.). *Teaching in the universities*. Montreal: McGill-Queens University Press, 1975.

Shulman, L. S., & Elstein, A. S. Studies of problem-solving, judgment, and decision-making: Implications for educational research. East Lansing, Mich.: Office of Medical Education, Research and Development, 1974 (to appear in *Review of Research in Education*, Volume 3).

Snow, R. E. Representative and quasi-representative designs for research on teaching. *Review of Educational Research*, 1974, **44**, 265-291.

Thelen, H. A. *Classroom grouping for teachability*. New York: Wiley, 1967.

ACT Research Reports

This report is Number 73 in a series published by the Research and Development Division of The American College Testing Program. The first 26 Research Reports have been deposited with the American Documentation Institute, ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D.C. 20540. Photocopies and 35 mm. microfilms are available at cost from ADI; order by ADI Document number. Advance payment is required. Make checks or money orders payable to: Chief, Photoduplication Service, Library of Congress. Research Reports No. 27 through No. 59 have been deposited with the National Auxiliary Publications Service of the American Society for Information Science (NAPS), c/o Microfiche Publications, 440 Park Avenue South, New York, New York 10016. Photocopies and 35 mm. microfilms are available at cost from NAPS. Order by NAPS Document number. Advance payment is required. Beginning with No. 60, the ACT Research Reports have been abstracted by the Educational Resources Information Center (ERIC) Clearinghouse System. Printed copies of most of the reports may be obtained from ACT Publications, P.O. Box 168, Iowa City, Iowa 52240, at a cost of $1.00 per copy. Check or money order must accompany request.

The reports in this series published since October 1970 are listed below. A complete list can be obtained from ACT Publications.

No. 37 *Practices and Outcomes of Vocational-Technical Education in Technical and Community Colleges*, by T. G. Gartland, & J. F. Carmody (NAPS No. 01441; photo, $6.80; microfilm, $2.00)

No. 38 *Bayesian Considerations in Educational Information Systems*, by M. R. Novick (NAPS No. 01442; photo, $5.00; microfilm, $2.00)

No. 39 *Interactive Effects of Achievement Orientation and Teaching Style on Academic Achievement*, by G. Domino (NAPS No. 01443; photo, $5.00; microfilm, $2.00)

No. 40 *An Analysis of the Structure of Vocational Interests*, by N. S. Cole, & G. R. Hanson (NAPS No. 01444; photo, $5.00, microfilm, $2.00)

No. 41 *How Do Community College Transfer and Occupational Students Differ?* by E. J. Brue, H. B. Engen, & E. J. Maxey (NAPS No. 01445; photo, $5.50; microfilm, $2.00)

No. 42 *Applications of Bayesian Methods to the Prediction of Educational Performance*, by M. R. Novick, P. H. Jackson, D. T. Thayer, & N. S. Cole (NAPS No. 01544; photo, $5.00; microfilm, $2.00)

No. 43 *Toward More Equitable Distribution of College Student Aid Funds: Problems in Assessing Student Financial Need*, by M. D. Orwig (NAPS No. 01543; photo, $5.00; microfilm, $2.00)

No. 44 *Converting Test Data to Counseling Information*, by D. J. Prediger (NAPS No. 01776; photo, $5.00; microfiche, $2.00)

No. 45 *The Accuracy of Self-Report Information Collected on the ACT Test Battery: High School Grades and Items of Nonacademic Achievement*, by E. J. Maxey, & V. J. Ormsby (NAPS No. 01777; photo, $5.00; microfiche, $2.00)

No. 46 *Correlates of Student Interest in Social Issues*, by R. H. Fenske, & J. F. Carmody (NAPS No. 01778; photo, $5.00, microfiche, $2.00)

No. 47 *The Impact of College on Students' Competence to Function in a Learning Society*, by M. H. Walizer, & R. E. Herriott (NAPS No. 01779; photo, $5.00; microfiche, $2.00)

No. 48 *Enrollment Projection Models for Institutional Planning*, by M. D. Orwig, P. K. Jones, & O. T. Lenning (NAPS No. 01780; photo, $5.00; microfiche, $2.00)

No. 49 *On Measuring the Vocational Interests of Women*, by N. S. Cole (NAPS No. 02071; photo, $5.00; microfiche, $1.50)

No. 50 *Stages in the Development of a Black Identity*, by W. S. Hall, R. Freedle, & W. E. Cross, Jr. (NAPS No. 02072; photo, $5.00; microfiche, $1.50)

No. 51 *Bias in Selection*, by N. S. Cole (NAPS No. 02073; photo, $5.00; microfiche, $1.50)

No. 52 *Changes in Goals, Plans, and Background Characteristics of College-Bound High School Students*, by J. F. Carmody, R. H. Fenske, & C. S. Scott (NAPS No. 02074; photo, $5.75; microfiche, $1.50)

No. 53 *Toward an Integration of Theory and Method for Criterion-Referenced Tests*, by R. K. Hambleton, & M. R. Novick (NAPS No. 02075; photo, $5.00; microfiche, $1.50)

No. 54 *College Student Migration*, by R. H. Fenske, C. S. Scott, & J. F. Carmody (NAPS No. 02215; photo, $5.00, microfiche, $1.50)

No. 55 *Predictions of Performance in Career Education*, by M. R. Novick, P. K. Jones, & N. S. Cole (NAPS No. 02216, photo, $5.00; microfiche, $1.50)

No. 56 *Predictors of Graduation from College*, by E. Nicholson (NAPS No. 02217; photo, $5.00; microfiche, $1.50)

No. 57 *Schooling and Subsequent Success: Influence of Ability, Background, and Formal Education*, by L. C. Solmon (NAPS No. 02218; photo, $5.00; microfiche, $1.50)

No. 58 *Common Fallacies about Heredity, Environment, and Human Behavior*, by A. Anastasi (NAPS No. 02220; photo, $5.00; microfiche, $1.50)

No. 59 *A Study of the College Investment Decision*, by W. W. McMahon, & A. P. Wagner (NAPS No. 02219; photo, $5.00; microfiche, $1.50)

No. 60 *Implementation of a Bayesian System for Decision Analysis in a Program of Individually Prescribed Instruction*, by R. L. Ferguson, & M. R. Novick

No. 61 *Nationwide Study of Student Career Development: Summary of Results*, by D. J. Prediger, J. D. Roth, & R. J. Noeth

No. 62 *Varieties of Accomplishment after College: Perspectives on the Meaning of Academic Talent*, by L. A. Munday, & J. C. Davis

No. 63 *Patterns of Concentration in Large Foundations' Grants to U.S. Colleges and Universities*, by R. Colvard, & A. M. Bennett

No. 64 *Vocational Choice Change Patterns of a National Sample of Community-Junior College Students*, by C. S. Scott, R. H. Fenske, & E. J. Maxey

No. 65 *Considerations and Procedures in National Norming: An Illustration Using the ACT Assessment of Career Development and ACT Career Planning Program, Grades 8-11*, by D. L. Bayless, J. W. Bergsten, L. H. Lewis, & R. J. Noeth

No. 66 *The Measurement of Economic Well-Being in Need Analysis Models*, by W. J. Goggin

No. 67 *Assessing the Career Interests of College Youth: Summary of Research and Applications*, by G. R. Hanson

No. 68 *Sex-Role Socialization and Employment Realities: Implications for Vocational Interest Measures*, by D. J. Prediger, & N. S. Cole

No. 69 *Predictive Validity of the ACT Tests at Selective Colleges*, by O. T. Lenning

No. 70 *Trends in the Academic Performance of High School and College Students*, by R. L. Ferguson, & E. J. Maxey

No. 71 *Declining Admissions Test Scores*, by L. A. Munday

No. 72 *Validity of the ACT Interest Inventory for Minority Group Members*, by R. R. Lamb