DOCUMENT RESUME

ED 073 408 CG 007 855

AUTHOR Waetjen, Walter B., Ed.
TITLE Human Variability and Learning.
INSTITUTION Association for Supervision and Curriculum Development, Washington, D.C.
PUB DATE 61
NOTE 96p.
AVAILABLE FROM National Education Association, 1201 Sixteenth Street, N.W., Washington, D.C. 20036 (HC $1.50)

EDRS PRICE MF-$0.65 HC Not Available from EDRS.
DESCRIPTORS Anxiety; Creativity; Curriculum Development; Effective Teaching; Group Relations; *Individual Differences; *Learning; Learning Motivation; Motivation; Publications; *Student Characteristics; Students; *Student Teacher Relationship; Teachers; Teaching

ABSTRACT

This publication is a collection of papers and reports presented at the Fifth Curriculum Research Institute. The articles included reflect the Institute's position which recognizes that a teacher must know the child whom he is to teach; knowing the children's experiential background enables the teacher to alter the sequence of curriculum content and the pace of presentation. In addition, being aware of aspirations and self-conceptions of children suggests appropriate, effective methods of evaluation. Papers on anxiety and motivation by Seymour Sarason and Richard Alpert indicate ways in which certain psychological variables influence learning. Group relationships and individual uniqueness are explored in papers by Herbert Thelen and Ronald Lippitt. Calvin Taylor, a consultant to the Institute, discusses how creativity is apparent in the behavior of individuals. The publication not only identifies selected aspects of human variability but it also explores their relationship to learning. (Author/SES)

Human Variability Learning

Papers and Reports from
The Fifth Curriculum Research Institute

Edited by Walter B. Waetjen
Chairman of the Institute Staff

Association for Supervision and Curriculum Development
A department of the National Education Association
1201 Sixteenth Street, N.W., Washington 6, D.C.

Price: $1.50

Contents

Foreword

The ASCD Curriculum Research Institutes have developed in a way and in a direction of considerable interest. Their evolution represents a direction that is going on in education generally—a direction with much to commend it.

The direction is from a position of passive consumption of the research of others to active production of educational knowledge. The first two ASCD research institutes were devoted to the idea of educational research itself. The participants—who, by the way, have always paid their own way to these institutes—rediscovered, at these first institutes, the personal and technical meaning of research. They shifted themselves from the consumer's to the producer's point of view, and in so doing found that only as coproducers could they "consume" research knowledge from others, meaningfully. This discovery has had important consequences, some of which are evident in the present publication.

As producer, there is no end to the knowledge one needs, and there is no limit to the demands for authoritative sources one makes. What is most interesting to me about the present volume, therefore, aside from the material itself, is the fact that we professional educators now want our knowledge given by those who have developed it, uninterpreted in educational terms. We want it directly from the scholar himself. We claim to have the responsibility to translate it into educational terms, and demand of ourselves that we continue to develop our ability to do so.

In accepting this responsibility, we have found a way of relating ourselves to the source of the knowledge we need. We have once more, after too long an interval, put ourselves in contact with the main stream of American scholarship, which is itself in contact with scholarship elsewhere in the world. In these times of national and world crisis, and therefore of crisis in American education, we could be doing nothing more important than this for our present or our future.

The Association is indebted to Walter B. Waetjen, Director of the Institute Staff, for final editing of the manuscripts. Robert R. Leeper and Ruth P. Ely, of the ASCD staff, guided production of the booklet.

Arthur W. Foshay, *President*
Association for Supervision and
Curriculum Development, NEA

January 1961

Preface

The ASCD Curriculum Research Institutes have, from their outset, been concerned with the question of how people learn. The first two Research Institutes focused on the learning of those in attendance. Specifically, these Institutes attempted to communicate how-to-do-it skills for those interested in initiating and conducting cooperative curriculum research. That emphasis, with modification, has continued through the Fifth Curriculum Research Institute, of which this booklet is a report. However, beginning with the Third Research Institute, consultants were engaged to review research findings about human learning. Thus, the Institutes have two major foci: helping participants to *learn* research techniques, and building a body of substantive facts about the learning process.

Perhaps it is appropriate to ask whether a professional association such as ASCD should be interested in learning. One might argue that educators should be interested only in their own activity, which in this instance would be teaching. We are aware that a small but highly vocal group of persons clamors for "staying with the facts" and emphasizing "good" instruction. Since the latter is idealistic, no one can argue with it. Every parent and teacher believes in good teaching and does what he can to assure that it occurs. It should be apparent that we have constructed a dichotomy: on the one hand there is teaching, and on the other there is learning. What is even more unfortunate is that dichotomous units are often antithetical. Thus we find ourselves in the rather ridiculous position of seeing the teacher and teaching as being in apparent opposition to the learner and learning. If this case is oversimplified, it only serves to show more clearly that teaching and learning are parts of the parcel which we call education.

In a rather implicit way the Curriculum Research Institutes have subscribed to a belief about teaching and learning which is worth further discussion and inquiry. This position recognizes that a teacher must *know* the child whom he is to teach. By name, yes, but more important, he must know something about the way that child sees himself as a learner, the

aspirations he has, the richness or paucity of experience he has had and the kind of family situation in which he finds himself. These are facts which may come to light slowly, but unless sought may never be known.

On the other hand, the teacher has another task which is even more difficult than the former. A teacher who is dedicated to the idea of learning not only seeks to learn about his students, but he seeks to learn about himself. A good teacher is one who is always examining his ways of handling children, the expectations he has of children, and the way he conceives of the roles of learner and teacher. This teacher is openly self-critical and self-evaluative, but is not unfriendly toward himself. Such a teacher does not have to be a psychiatric baby-sitter, nor does he have to be an analyst preoccupied with self-analysis. Fundamentally, this teacher recognizes that since teaching and learning are such *human* processes, he must know something about the humans who are involved.

Where does the curriculum enter into the picture? In this conception the curriculum is not distorted, adulterated or watered-down. As the teacher understands the children in his classroom, he groups for implementing one aspect of the curriculum differently than he would for another. Knowing the children's experiential background enables the teacher to alter the sequence of curriculum content and appropriately increase or decrease the pacing of presentation of new material or opportunities. Being aware of the aspirations and self-conceptions of children suggests appropriate and effective ways of evaluating. As the teacher comes to know himself, he modifies his goals for children so that these are more realistic. In like manner the teacher requests help in certain curriculum areas which he can admit to not knowing adequately. Neither is he distressed by the apathy of students nor their negative comments about school. The curriculum is viewed by this teacher as a reality which is implemented according to the teacher's knowledge of himself, his knowledge of the learner and his group relationships in the classroom.

The arrangement of this booklet almost recapitulates the organization of the Fifth Curriculum Research Institute. The importance of the theme, "Human Variability and Learning," for curriculum and instruction is discussed by Denemark. He sets the curricular stage for the papers that follow. The task of setting the stage is no easy one, for the person must be able to articulate knowledge about individual differences with curriculum practices. Denemark handles this task admirably. Following the "stage setting" section are two treatises on anxiety and motivation. These papers were written by Seymour Sarason and Richard Alpert, respectively. Inclusion of these treatments is a reflection of the staff's eagerness to ascertain the ways in which selected psychological variables influence learning.

Social scientists have made teachers keenly aware of the fact that the individual has an impact on the group in which he finds himself. There has been considerable emphasis on this point of view. We wanted to find out what the group contributes *to* the individual, recognizing that this could markedly influence one's uniqueness. The papers by Herbert Thelen and Ronald Lippitt are in answer to our question about group relationships and individual uniqueness. Following these papers is one on creativity, by Calvin Taylor. Since some persons are so obviously more creative than others, this must be a manifestation of the individual differences in people. We wanted to know how creativity is apparent in the behavior of individuals. Both Morris Stein and Calvin Taylor, who were the consultants to the Research Institute, enlightened us on this subject. Unfortunately, Stein's paper, because of other demands on his time, is not included in this booklet.

The final section of the booklet is written by the present author. It is an attempt to distill from the consultants' papers some recurring themes that have to do with learning. It should be understood that the consultants are not to be held accountable, necessarily, for the ideas expressed. There is a section in which problem areas for research, field exploration, and curriculum experimentation are proposed. It is altogether fitting that the booklet conclude by emphasizing research, since this was why the Curriculum Research Institutes were founded in the first instance.

The Institute was staffed by a group of competent and dedicated persons who gave unstintingly of their time and talent. The names of these staff members follow: *Eastern Section*—Glenn Dildine, National 4-H Foundation; Margaret Gill of the Association; Gerald Gleason, University of Wisconsin-Milwaukee; Gordon Liddle, University of Chicago; and David Turney, George Peabody College for Teachers; *Western Section*—George Denemark, University of Wisconsin-Milwaukee; Fannie Shaftel, Stanford University; Fred Wilhelms, San Francisco State College; and Gertrude Wood, Office of the Superintendent of Schools, Los Angeles County; *both Sections*—Robert Bills, Auburn University; O. L. Davis then of the Association and now with the University of North Carolina; and Robert Ridgway, University of Kansas.

The National Institute of Mental Health, through William Hollister, M.D., and Alan Miller, M.D., has made a significant contribution to the success of the Research Institute through its aid in selecting consultants, staffing the Research Institute and making pertinent suggestions about its organization.

December 1960

WALTER B. WAETJEN, *Chairman*
ASCD Research Commission

A Setting . . .

Human Variability and Learning: Implications for Education

George W. Denemark

What are some implications for the curriculum worker of the theme of this booklet—"human variability and learning"? Rather than attempt to extend the research frontiers on human variability, let us reflect on the meaning of new thinking concerning human variability and on the task of the classroom teacher, the supervisor and others who are interested in the improvement of instruction in today's schools.

A research approach to the impact of human variabilities upon learning is highly important to the curriculum worker. He knows of the tremendous current interest in education exhibited from many quarters. The public is expressing an interest in and concern for education with a degree of intensity and involvement that our society has not experienced for many years. This public interest is being whetted and shaped by many agencies of mass communication. This awakened interest represents a tremendous potential to education, either for good or for ill. Much depends upon how such interest is channeled and upon the depth and penetration of insight in the ideas and concerns that are expressed.

Too often when a subject is treated in terms of consumption by a mass public there is a tendency for ideas to be seriously oversimplified. Today we are experiencing the attempts of many seeking to reach a mass audience by representing important educational issues in terms of clever

phrasing, "cute" statements, and neat, readable, but grossly oversimplified representations. These oversimplifications represent a major problem for the curriculum worker and a major reason for seeking to deal with the issues of teaching and learning in an equally spirited but intellectually rigorous and morally defensible manner. A research approach to the practical problems of the classroom seems to be an imperative of our times.

Current Oversimplifications

Five current oversimplifications relating to education may illustrate our concern. First of these is the constriction of complex, many-faceted problems into two-sided, either-or matters. Complex problems having multiple causes and a range of consequences do not easily capture the layman's interest when represented accurately in terms of a myriad of alternatives. Those persons concerned more with stirring the emotions of lay citizens than with enlightening them or presenting them with the accurate dimensions of an issue, find it easier and more successful to cast such problems in terms of *this or that*, of *either-or*. And so today we hear talk of quantity *or* quality in education, as if we must choose one or the other. We hear talk about a single standard of achievement for everyone *or* no standards at all. We hear about an emphasis upon the development of the intellect *instead* of social development. We hear of the choice between rigid discipline *or* complete chaos in the classroom. All around us are evidences of the gross oversimplification associated with either-or thinking that fails to fit the realities of the complex educational problems of our day.

A second kind of oversimplification of the day is the emphasis upon crash programs in education. Involved here is the notion that societal problems and shortcomings can be dealt with successfully by the launching of short term, large scale curriculum innovations. The limitations of this approach were well analyzed by the Rockefeller Fund Committee in *The Pursuit of Excellence*.

It is tempting to treat the problem of highly trained manpower in terms of the specific shortages which occur from time to time, but the true difficulty lies deeper. It is not a shortage now of engineers, now of economists, that lies at the root of the problem. It is the constant pressure of an ever more complex society against the total creative capacity of the people. The problem breaks through to the surface in terms of specific lacks but exists as an underlying pressure at all times. A piecemeal approach defeats itself. In the first place, the lead time needed to train and develop talents is too long to allow crash programs to pay off. By the time we have brought up a generation of a particular kind of specialist, the need for the speciality may have been replaced by some other even more pressing need. We cannot now identify the skills needed ten years hence. Our most critical need a decade hence may be unknown

today. Rather, we must prepare ourselves for a constant and growing demand for talents of all varieties and must attempt to meet the specific needs of the future by elevating the quality and quantity of talented individuals of all kinds.

A third kind of current oversimplification relating to education may be noted in the preoccupation of some persons with the labels on the "jars" in the "curriculum pantry" rather than with the contents of the "jars" themselves. So many persons seem to be urging more science, more mathematics, more phonetics, more history—more something—for the school curriculum with the apparent blithe assumption that whatever is done in the name of these important areas is, of itself, good and proper, and will result in the improvement of education. Even as sophisticated, and knowledgeable a critic as Dr. James B. Conant has tended to focus primarily upon naming and specifying the desirable amount of the proper subjects for the high school curriculum rather than upon the much more difficult questions relating to the specific content and learning experiences appropriate to a quality secondary education. Too many busy critics of today's schools have been content to deal with the program of the school in terms of labels rather than in terms of what goes on behind those labels.

A fourth oversimplification arises when those who do get beyond the labels in their thinking and into the program itself conceive of content almost entirely in terms of what is put into a course rather than what learners get out of it. Even among professionals many of our concerns for curriculum guide preparation, for unit development, for textbook writing seem to focus almost entirely upon what goes into the course, or unit, or book rather than what children and youth may get out of it. The real curriculum for a given group of boys and girls may be far different from that which a well-meaning but naive writer may set down on paper.

A fifth serious oversimplificarion regarding education is the mistaken assumption that common agreement on the fandamentals on the basic goals of a program, necessarily means identity of content, methods, materials of instruction, or means a single standard of achievement for all. The need for agreement on the broad, fundamental goals of education falls far short of demanding anything like sameness in educational methods, materials and approaches. Indeed, these basic goals would appear to lend far more support for variety than for identity in teaching and learning. Yet too many voices are heard today advocating an identical educational program for all and, curiously enough, doing so in the name of individualism!

What are the alternatives available to us if we are to avoid some of these oversimplifications? Unless we are ourselves willing to merely accept

[1] Special Project Panel, Rockefeller Brothers Fund. *The Pursuit of Excellence and the Future of America*. Ga den City, New York: Doubleday and Company, Inc., 1958. p. 10-11.

other glib generalizations, other cute phrases, other easy answers, the only real alternative is one involving the development of a solid understanding of human variability and learning through research and experimentation. While it is only human to be tempted by the apparent success achieved by some of our critics (and, sad to say, some of our associates) with the techniques of oversimplification, the moral and intellectually sound approach lies in the application of logical and experimental methods to the problems of human development and learning.

Differing Views of Human Variability

With this much support for the research approach to the problems of learning which are linked to human variabilities let us next turn our attention to a clarification of the sense in which we are using the term "human variabilities." For purposes of this discussion the term has been given a very broad interpretation and will be used in three ways. We shall be considering human variabilities (a) in relation to the differences among or between members of a group, (b) in terms of the variability within a given individual in capacity and performance as these relate to a range of areas of experience, and (c) in terms of the variation in the demands upon or expectations of individuals because of their environment.

The first of these three interpretations of the term will help us to keep in mind the wide range of difference which exists among members of almost any school group. The second is intended to remind us of the fact that few if any of us are uniformly able or uniformly poor at everything but rather excel (or at least have the potential for excelling) in certain areas while performing less skillfully in others. The third, and perhaps most unusual interpretation of the term, human variability, is intended to help us consider the variations in the demands which a society makes upon individual members as well as considering the differences in and among those individuals. The significance of this interpretation may be seen in the extent to which societal values support human variability or support standardization and conformity. The crucial question is whether the society and its institutions look upon differences in and among individuals as a source of strength, as something to be nurtured and cultivated, or as a source of weakness and needless complication, something to be tolerated and minimized. Depending upon the choice of values made here, human variability may be viewed either as a blessing or a curse, a vexing problem or a wonderful resource.

Some educators see their task as standardization, as the development by the school of a uniform product. To them human variability represents a problem, something schools must struggle with and eliminate as far as possible in order that all of the students can be fitted into a neat, manage-

able framework for learning that corresponds with the existing organization and structure of society. There is, of course, an element of inevitability about this function of the schools for it is true that the very definition of a society incorporates the requirement of shared belief, of a core of behaviors and values common to its members. Without continuing efforts to enlarge the circle of common commitment through schools and other social institutions, our communities would quickly become merely aggregations of individuals.

Other educators, concerned primarily with helping students adapt to a rapidly changing and increasingly complex world, perceive variability as a tremendous resource. To be sure, this human potential is not without problems, but the problems are those of utilizing variability most effectively and of extending variation within and among individuals rather than trying to eliminate it. Thus we may note two ways of looking at the facts of human variability: as the source of problems which one should seek to eliminate, and as an important resource which should be utilized most effectively. The school curriculum and the methods of instruction will differ markedly according to which of these views is held by teachers and administrators.

Areas of Variability

Differences in Perception

In considering human variability and its implications for learning, six areas seem especially salient. The first of these is the area of difference in perceptions among individuals. People behave basically in terms of what seems to them to be so rather than what others think to be true or what others might wish them to believe. Children and youth often learn very differently in circumstances which to the outside observer have many identical elements because the students' perceptions are different. Some of us may recall from our childhood a game which involved observing the contents of a store window for perhaps two minutes and then at a later time writing down a list of as many items as could be remembered. Suppose we were to ask a family of four to participate in a modified version of this game by walking past a series of window displays in a downtown department store and then asking each member, upon returning home, to record his or her recollections of the contents of the windows. It is likely that the lists would be very different. Mother's list might include many of the details of the fur scarfs, new dresses and spring hats seen in several windows, father's the golf clubs and home workshop equipment, junior's the baseball gloves and camping paraphernalia, and sister's the dolls and other things related to her own interests. All looked in the same windows but each came away with different recollections, with different

perceptions of the things that were there. Their own interests and sensitivities conditioned their awareness and their recollection of what was around them. This illustration suggests a basic variable in humans and a fundamental fact for education—the variability in perception that exists among students, and between students and their parents and teachers.

Translating the matter into more conventional educational terms we might reflect on the possible differences in perception existing between a given student and the instructor in a class in world literature. A major objective of the teacher is likely to be that of instilling in each of his students a love of good literature. The impact of the experience on one or sometimes on many students may be extremely negative, a painful ordeal, leading him to the conclusion that he will never again read this sort of thing after he is free from the obligations of the class. Under such circumstances the teacher has one set of perceptions about the teaching-learning experience centering on the objectives of the course and his own aspirations while the student may have a very different perception of what is happening. The outcomes, in terms of the student's feelings, may be far different from the objectives.

Recently an article in the *Saturday Review* told of a kindergarten girl who was asked to react to a classroom in a newly completed school building. The girl went into the room, looked about for a moment, and turning to her interrogator commented, "This room says 'yes'." The article continued by proposing that every classroom and every teacher ought to say "yes" to boys and girls because the world around them more and more says "no." The perception of her schoolroom by this child as a friendly, good place, one lending encouragement to her interests and efforts is indeed different from the negative, restrictive, confining feeling that some of us and too many of today's children have associated with school and with learning. These differences in perception represent human variabilities with tremendous significance for the educative process.

Before turning to another area of human variability it would be well to note that perhaps the most important perception of all is that of self-perception—the notion which the individual has of himself. In too many instances young people have established self-quotas for failure rather than ambitious self-expectations for achievement and success. Too often they have come to view themselves as unable to do very well, having little to contribute, and inferior to most everyone else around them. Unfortunately, parents and teachers sometimes lend support to such evaluations and in so doing confirm a self-perception of mediocrity that becomes a major determinant in the subsequent behavior of the child. If his own expectations and those of others demand little of him, he is unlikely to perform beyond those expectations. The devastating effects of the insensitive teacher's categorization of his students into the bright and the stupid, the

industrious and the lazy, the honest and the cheaters, etc.—categorizations which are soon communicated to the individuals and the group—are hard to overstate as influences upon the performance of children and youth. Self-perceptions are extremely important in the learning process and represent a significant facet of human variability to which curriculum workers must remain sensitive.

A second area of difference important to learning is that of variations in types of intelligence. Educators must recognize that the school population represents many kinds of ability and many levels of talent. As the Rockefeller Report warns, we must not make the mistake of adopting a narrow or a constricting view of excellence. Our conception of excellence must embrace many kinds of achievements at many levels of performance. No single scale or simple set of categories will be adequate to measure excellence. There may be excellence in abstract intellectual activity, in art, in music, in managerial activity, in craftsmanship, in technical work, to mention but a few. Intelligence and excellence have many dimensions, many variations among children. All must be recognized. All must be planned for. Again quoting from *The Pursuit of Excellence:*

> If we are really serious about equality of opportunity we should be serious about individual differences because what constitutes opportunity for one man is a stone wall for the next. If we are to do justice for the individual we must seek for him the level and kind of education which will open his eyes, stimulate his mind, and unlock his potentialities. We should seek to develop many educational patterns, each geared to the particular capacities of the student for whom it is designed.[2]

Differences in Maturity Levels

A third area of human variability important to learning is that of the differences which exist in individuals in terms of various maturity levels. Obvious and important human differences are apparent as we are here concerned with a group of nursery school children, here with a class of early adolescents, and at another point with an adult group of parents or teachers. Significant differences in attention span, small muscle coordination, capacity for self-direction and for dealing with abstractions are but a few of the many variables linked with maturation. Programs must be planned which take into account these kinds of differences. Many easy assumptions about curriculum and about teaching methods are in need of critical re-examination in the light of systematic experience and research data on maturational implications for learning behavior. For example, a favorite rationale for the organization of the elementary curriculum has been the concentric circle approach. The assumption is that the interests of the primary child are focused on himself and his immediate family.

[2] *Ibid.* p. 32.

As he grows up his interests are thought to extend first to neighborhood, next to total community, then to state and nation, and finally at a much more mature age, to the world. This plan has a good deal of logical appeal, but it would seem that today's children less and less fit such a pattern. Boys and girls at many ages and stages of development demonstrate interests in problems and concerns, people and things far beyond the reach of their own neighborhood, even their own nation. As the problems of a world community press in around their families, these children display an ability to deal with these broader dimensions of human relationships in a manner that necessitates our reassessment of the pattern of the school curriculum.

Another evidence of need for rethinking about the impact of differences in maturity upon learning lies in the extent to which some of us stoutly maintain that teaching is the same for everyone—that the same approaches, techniques and procedures used for college classes and for adult groups can be employed with elementary school children—or vice versa. It is extremely important that we actively seek out the common characteristics of effective teaching and learning in all subject fields and at all levels. It is equally important that we recognize that the techniques and procedures by which we seek to implement common basic objectives must be geared to the stage of maturity represented by our students. The first grade teacher who, after a 45 minute arithmetic session with her children, dismisses them for recess with the remark, "When you return we'll continue with our arithmetic lesson"; the high school program that provides students no time for independent work and study; the college education professor who makes his mature charges wince by treating them as if they were kindergartners rather than adults—all these are illustrations of failure to understand the maturity level of the group being instructed. Much concern is being expressed currently over the extent to which American secondary education has failed to treat adolescents with the maturity they deserve. The recent committee report, *Images of the Future*, deals provocatively with suggested changes in the program, organization and physical structure of the high school of the future to provide for more individual projects, more independent study, and more personal responsibility.[3] Much needs to be done to better match our secondary schools to the real potential of the youths they seek to serve.

Differences in Rate of Maturation

A fourth area of human variability important to learning is that associated with differences among children with respect to their rate

[3] J. Lloyd Trump, *Images of the Future*, Washington, D.C.: National Association of Secondary-School Principals, a department of the National Education Association, 1959.

of maturation or development. We have just been considering some implications for learning of different maturity levels. It is also important to recognize that among individuals within the same general age group there are wide variations in rate of maturation and development. As Professor Evelyn Wenzel of Syracuse University has pointed out, "Some children operate on standard time, but a sensitive teacher knows there are many exceptions and that time cannot click off at the same rate for all." Perhaps there is something to be learned from the experience some of us have had with tomato plants. After a long, cold winter the enthusiasm for spring, helped along by the careful perusal of seed catalogs, causes the eager gardener to begin working the ground almost before the frost has left it. Tomato seeds, planted weeks before in indoor flats, have progressed well and the biggest of these are set out in the garden long before one's less ambitious neighbors get around to it. Visions of succulent fruit begin to dim, however, as the weeks go by and the plants struggle along looking weak and wan. About the time the plants finally begin to show some likelihood of surviving, along comes a neighbor with fine, big plants to put into the ground. Somehow all of the weeks spent struggling with your plants now seem wasted. The neighbor has put his in at the right time with season, plant and earth ready and the plants thrive, more than matching the growth of your own which had been set out much earlier.

So it is with children. Our failure to recognize variations in the rate of development among children, to recognize the importance of the concept of readiness can cause us to devote tremendous energy to and be terribly wasteful in the educational enterprise, trying to accomplish objectives that are simply not appropriate to a child at that point. The same goals may be reached quickly and easily when the organism has developed the kinds of physical and mental maturity necessary for them. Trying to achieve such objectives too early may not only be wasteful of the school's efforts but may leave the children with initial negative experiences in such areas that will be difficult to overcome later.

Variations in Societal Demands

A fifth area of human variability turns us momentarily from the individual to look instead at the social context in which he operates. It is as important for the educator concerned with human variabilities to comprehend the demands which society makes upon individuals for such variations as it is to perceive the adjustments which society must make because of other variations. To what extent are human variabilities called for—demanded—by changes in the environmental situations to which learning is expected to apply? We live in a world of tremendously rapid change, a world in which the pace of change continues to accelerate.

Such changes serve to increase the complexity of living for each of us. An editorial in the *Saturday Review* for March 12, 1960, makes the point.

> There was a time when a seminal idea or a watershed event came along only infrequently, making its appearance against a seemingly permanent background of "unalterable law." For years after its advent, savants would gather about the new arrival, remarking its size and luster, and minutely tracing its relationship to the main body of ideas and events. Today, however, momentous events have themselves become the norm, the shimmering backdrop against which the stable concept or institution stands forth as a freak of nature. Our world has become a permanent explosion.[4]

In such a world, it is well to inquire as to how persons and institutions have dealt with change. To what extent have societal patterns, school programs adapted and adjusted with sufficient flexibility to meet and cope with a world of tremendously rapid change, a world characterized as a permanent explosion? James Michener's book, *Hawaii*, provides a fictional but disturbingly realistic illustration of social inflexibility in describing the behavior of some of the early Christian missionaries who came to the islands from New England.

> One of the peculiarities of the missionaries was that they insisted upon living in tropical Hawaii exactly as if they were back home in bleak New England. They wore the same heavy clothing, did the same amount of tiring work, ate the same heavy meals whenever they could be obtained. In a land rich with Polynesian fruits, their greatest joy was to obtain from some passing ship a bag of dried apples, so that they could enjoy once more a thick, sweet apple pie. Wild cattle roamed the hills, but the missionaries preferred salt pork. There was an abundance of fish in the shallows, but they clung desperately to dried beef shipped out from Boston. Breadfruit they rarely touched, and coconuts were heathenish. In all his years on Maui, Abner Hale would never once do any of God's official work unless costumed in underwear, heavy woolen pants, long shirt, stock, vest, heavy claw-hammer coat and, if the meeting were outside, his big beaver hat.
>
> But what was impossible to comprehend was the fact that each year, on the first of October, when the Hawaiian summer was hottest, mission families regularly climbed into heavy woolen underwear. They had followed this custom in Boston. They would follow it here.[5]

The account sounds most humorous and the inflexibility most ludicrous focusing as it does upon other people in another era. But what of today and the flexibility or inflexibility evident in contemporary life? What about our schools? How effective have they been in adjusting to changing conditions of life? Are there evidences in the school curriculum, in school organization and programming of the same brand of inflexibility

[4] Hallowell Bowser. "The Permanent Explosion." *Saturday Review* 28; March 12, 1960.

[5] James A. Michener. *Hawaii*. New York: Random House, 1960. p. 257.

characterized by Michener in terms of the dried beef, the beaver hat, and the heavy underwear among the early Hawaiian missionaries?

Evelyn Wenzel struck close to home in describing some school practices that smack much more of rigid, unyielding patterns than of broad flexible designs.

> One year in the first grade, one year in the second, six years in grade school, two in junior high, four years in each of high school and college. Sixteen years—one-fourth of a lifetime, more or less—set aside for schooling. A pattern within which we must work. Creatively or uncreatively?
>
> 9:00 Show and Tell; 9:10 Spelling; 9:30 English; 10:00 Arithmetic . . . and so on through a neatly packaged day. "Hurry now, everybody should be finished. . . . Johnny, why must you *always* hold us up. . . . Don, you *know* we only sharpen pencils before the bell rings. . . . *Everybody* in line. If you don't go now, Chris, you'll be asking later to be excused. . . . No, we can't dramatize this story. We won't finish the book if we don't get on to the next story. . . . No one in the building until the bell rings! . . .
>
> Pressures of many kinds, some from within us, some imposed from without, cause us to forget that creative teaching takes time—not over-all more time, necessarily—but time used flexibly. Creative teaching and learning demand time to capitalize upon the mood of the moment, to finish the story before inspiration wanes; time to explore for ideas, to meander in our planning, to take off on a side road or two, until we hit on just the right idea for our assembly program; time to slow down when work is hard and speed up when it is easy; time to play longer when we're full of "kinks" inside.
>
> We have come a long way, by and large, from the screwed down desks arranged in rows of endless sameness that constituted the once-standard classroom pattern. Many old schools now have unscrewed the desks and new schools have movable furniture so that the room may be rearranged to meet the needs for grouping; for "stage" space at the front or dancing space in the middle; for individual study time; for a circle arrangement for discussion or sharing; or for seating space at a parent meeting.[8]

With respect to thinking, too, Professor Wenzel recalls for us, by her illustrations, incidents that suggest inflexibility rather than creative adaptations to unfamiliar problems.

> "Class stand, line up, pass," snapped the orders and the fourth grade responded. Somewhat hypnotized by the speed and precision of the operation, as an observer in the room, I followed suit. I asked the boy next to me where we were going. A shrug indicated he did not know. We were both enlightened as we were led into the projection room to see a film.
>
> It was frightening to realize how completely the natural curiosity of this age has been destroyed by some four or five years of heavily routinized standing, lining up, and passing. Here were children who apparently could be led anywhere with no questions asked!

[8] Evelyn Wenzel, "Teaching: Pattern or Design?" *Educational Leadership* 13: 303-305; February 1956.

Curiosity is evidenced "naturally" in the spontaneous question-asking of young children: "How can a puddle go away? . . . How can Santa hear what you want for Christmas? . . . Could you walk on water? . . . What can I say if I can't say damn?" . . . What will happen to this versatile, four-year-old question-asker after she has been in school for several years? Will her teacher take over the question asking? Will she one day be in a fourth grade answering teacher-made questions: "How high is cacao? . . . What do Taro, Sago, and Dyaks mean? . . . Arctic lands have frost in (month)." Testing questions—those to which the questioner already knows the answers—are not creative questions that lead to hypothesizing. And so they seldom, if ever, can generate creative thinking.[7]

What of our own schools, our own classrooms? How is our curriculum, how are our teaching methods, meeting the changing needs of the times? As Agnes Meyer proposed so convincingly in her Kappa Delta Pi lecture,

Education . . . should be geared at once to the demands of the second industrial revolution. For the children who are now in school will either enjoy its infinite blessings or will be condemned to suffer from its worst consequences. They must be trained not as in the past for specific occupations, since these occupations may be obsolete by the time they graduate from high school or college. Nor will a return to the good old days of the three R's and the liberal arts prepare them for a world of perpetual change whose far-reaching effects nobody can wholly envisage. The stale humanist regurgitations will no longer do. Analysis of past traditions, habits and morals is essential in order to observe how old principles actually work under totally new conditions and how they must be modified in order to become more effective instruments in meeting new situations. The choice is not between throwing away ideals previously developed and sticking by them blindly and obstinately. The intelligent alternative, which can now no longer be evaded, is to revise, expand, and alter them. The problem of education and of life itself will henceforth be one of continuous re-adaptation. . . . Without this flexibility in our educational curriculum, our schools will remain what they always have been, a reflection of a society that has been left behind.[8]

Modern education must remain sensitive to the various and changing demands today's world places upon our children and youth. Human variability cannot be merely tolerated by educators when it is being demanded by the conditions of life around the school.

Differences in Objectives

A sixth and final area of variability important to learning is that of the differences in objectives for learning. Both among teachers and

[7] *Ibid.*, p. 304-305.

[8] Agnes E. Meyer, *Education for a New Morality*. New York: The Macmillan Company, 1957, p. 58-60.

students important differences may be seen in the objectives set for learning. Some of these variations include: (a) the objectives of general education versus specialized education; (b) the objectives linked to the development of a reasonable level of literacy over a broad range of fundamentals contrasted with the conception of developing considerable depth in one field; and (c) objectives associated with social class or other group factors. Failure to recognize that the purposes of schooling may be quite different for different individuals may cause us to draw many unwarranted conclusions about the appropriateness of certain content or teaching procedures. The sensitive teacher cannot assume that all come to school with the same objectives, or that those with purposes and interests different from those of the teacher must be remade in his image. One of the most perplexing pedagogical issues is that involving the determination of criteria to be applied to the efforts of teachers to change the behavior of students. Whose standards shall be used? The teacher's—the community's "upper class"—the parents'? Or is there some broad common denominator which can be constructed and applied? Whatever the answer, the question remains a most perplexing one for teachers and other curriculum workers.

The six areas of human variability just discussed appear to be of particular significance in any thoughtful consideration of the learning process. Several of them are linked to the individual and the broad range of difference existing within him. Some are associated with differences between individuals within a group. Still others focus upon the social environment and the varying demands which society makes upon its members. All combine, however, to represent critical dimensions of the task of the educator—that of helping each learner become that which he alone is capable of becoming.

Anxiety and Learning

SEYMOUR B. SARASON [1]

The concept of anxiety is one that is central in any systematic conception of personality or child development. Whatever theories of personality and development we have, give to the concept of anxiety an important, if not crucial and central, role. Anxiety is an experience which can have myriad consequences for the individual. Some of these consequences need not be negative. Some of them may, in fact, have positive values.

Anxiety as an experience is something which motivates an individual to do something. In its most extreme form anxiety can be equated with an experience or concept like terror. If one had to say what are the essential characteristics of the anxious reaction or the anxious experience, one would say that it is first an unpleasurable experience, secondly that it involves or is associated with physiological concomitants (perspiration, accelerated heartbeat, etc.) and, third, that it is a conscious experience.

Our research relating to anxiety began with the point that it did not seem to make too much sense to categorize or pigeonhole individuals as being anxious or hostile or aggressive in an over-all sense. This is clearly not the case, so we searched around for a situation in which we would get some hold on the problem of anxiety. One of the characteristic ways in which this problem has been handled in the research literature is to

[1] This paper was prepared from a taped talk given at the Institute.

put an individual into a situation involving stress, on the assumption that this would engender in him some kind of anxious reaction and that one could then study the effects of the anxious reaction in a variety of ways. The difficulty with this approach is that you do not know on what kind of individual you are having an effect.

The situation we chose for study was the testing situation. We live in a test-giving and test-conscious culture. It is not too much to say that the lives of people in our culture are determined by their performance on tests. We see individuals through the eyes of test scores. Such scores influence our thinking about ourselves and others. For example, if a child with an IQ of 180 takes the neighbor's cat and crushes it to death, we do not say that he did this *because* he has an IQ of 180. However, let a child with an IQ of 60 do it and we think we are explaining something when we say he did it *because* he has an IQ of 60 as if having pointed to a test score we have pointed to the etiological agent without which this kind of behavior would never have occurred.

The Testing Situation

Practically everybody in our culture has been in the testing situation. What is the likelihood that this is a situation which engenders the anxious reaction? We were quite aware that the testing situation does engender this reaction. We observed, when working with college students, that the testing situation engendered in many individuals an extremely strong anxious reaction, frequently having disabling effects. In fact, at Yale significantly more scholarship students fall in the high-anxious category than fall into the low-anxious category. The testing situation is not only a near universal experience in our culture but also an extremely important one in our culture. Clinical studies and observations indicated that this would be an invaluable situation in which to study the nature and the effects of anxiety on learning and personality development. It became clear to us as we continued our studies with college students that the problem of test anxiety had its origins well before college, so we decided to study this problem in elementary school children.

There were theoretical and practical objectives to our research. One practical objective can be put in the form of this question: How early in elementary schools can we identify children who are or will become one or another kind of problem? Our bias was that we would have to identify as early as possible those children who were likely to become one or another kind of problem, be it an academic problem or a personality problem. By focusing on a particular kind of anxiety our hope was that we could pick out those individuals relatively early who already were experiencing the disabling effects of this kind of reaction. Another practi-

cal objective in our studies was the problem of what one could do about it in the classroom.

What we did is relatively simple insofar as techniques are concerned. The problem in working with elementary school children, particularly in the very early grades, is that their comprehension of language is beyond that of their reading level. If we were going to develop a device that potentially would have practical value in the schools, it would have to be a relatively simple, group-administered procedure. What we did was to make a questionnaire that has to do with a child's attitudes toward and experiences in various kinds of testing or evaluation situations in the classroom. For example: "When the teacher asks you to go to the blackboard to write something do you get a funny feeling in your stomach or do you find that your hand shakes a little bit?" "Do you sometimes dream at night that you're in the classroom and the teacher is asking you a question and you don't know the answer?" There is a variety of questions. The child has before him an answer sheet on which he circles a "yes" or a "no."

When we first began to work in the elementary school, teachers and principals said they did not see any point in our attempting to administer our anxiety scales with children in the first and second grades. Tests, they said, are either not administered in these grades or they are very seldom administered and the children would not have the concept of test. I can say that almost without exception when I walked into a second grade class, holding papers under my arm, I could count on at least one child saying aloud, "We're going to get a test, we're going to get a test." They had the concept of test.

Performance and Anxiety

What about first grade children? We administered the scale at the beginning of the first grade and at the end of the first grade. At the end of the first grade, it is feasible to administer this questionnaire to the children. Let us elaborate this a bit. We say to the children, "We want to ask you some questions about how you think and feel. There are no right answers, there are no wrong answers. We just want to know how you think and feel about certain things. It doesn't make any difference what your neighbor puts down, we just want to know what *you* think and feel." Following the administration of the questionnaire I could count on at least two or three children coming up to me and saying, "When are we going to find out how we did?" The school culture is apparently one in which the concepts of right or wrong are very strong and these conceptions are reinforced daily. This is certainly true in our experience.

The results of our studies hold for children from grade one through

grade six. The first question we asked ourselves was about the relationship between test anxiety and IQ as defined by any so-called standardized intelligence test. We knew from our studies with college students that the correlation between level of test anxiety and IQ was negative and moderate, but very significant. That is to say, even among a group of select college students, the higher the reported test anxiety, the lower the IQ. With an elementary school population we were working with a much broader range of human ability and we did not know whether we would find the same thing or not. We have now run a minimum of several hundred correlations and we are convinced that there is a negative correlation between reported test anxiety and IQ. That is, the higher the test anxiety the lower is the IQ. The explanation for this correlation is by no means a simple one. You might say, "Well, after all, youngsters who are not so bright don't do as well, so when they come to test-like situations you would expect them to respond with something al a to anxiety." This does not explain why many very bright children get extremely high anxiety scores and it does not convincingly explain why, in a group of individuals where the lowest IQ is 120, we would get the same correlation.

We decided to take pairs of children matched for grade, sex and IQ, with one member of the pair being high-anxious, the other member of the pair being low-anxious. Note that the IQ measure is already affected by the test anxiety because the IQ is derived from a testing situation, the situation in which the high-anxious child is at a disadvantage. When we say that the high- and the low-anxious child have the same IQ, we are in fact saying it is likely that the IQ of the high-anxious child is somewhat above that of the low-anxious child. We studied these matched pairs of children in a variety of problem solving situations. In practically every situation the low-anxious children did significantly better than the high-anxious children. Under certain conditions, to be noted later, it is exactly the reverse. The predominant result is that when individuals are matched and put in usual kinds of problem solving situations, the low-anxious child does significantly better than the high-anxious child.

Why should a child be unduly concerned about how he does in evaluation situations? I assume that it is adaptive, it is realistic to be concerned. Yet why do so many children respond *unduly* anxiously in these kinds of situations? We should have films on how children respond to these problem situations because one of the things you would be struck by is *they cannot respond.* What is the learner anticipating that would cause him to respond so anxiously in this situation? What is going to happen to him if he doesn't do well? If you ask children, you tend to get stereotyped answers. One is struck by the disproportionate reaction to the possible consequences. But children respond to these situations

as if life itself depends on how well they do. We assumed that the child fears the consequences of a negative evaluation. The test is a situation in which he knows there is a right answer and that if the wrong answer is given life is not going to be as good for him as if he gave the right answer.

We asked ourselves what would happen if we could manipulate the test-like nature of the situation. In one experiment, we had 110 children to whom in the fourth grade we had administered our anxiety scale. On the same children we had Otis IQ scores from the second, fourth and fifth grades. When we divided these 110 children into high- and low-anxious at the median of the distribution, we found that in the second grade there was no difference between the two groups in Otis score. However, the rate of increase in score going from the second grade to the fifth grade for the low-anxious children was significantly greater than it was for the high-anxious children. In other words, scores tend to increase with grade or age and so you expect an increase, but what we found was that the rate of increase for the low-anxious children was higher than it was for the high-anxious.

With another test, it was exactly the opposite. The other test was the Davis-Eells problem solving games which is not given as a test, but is given as a game. The word "test" is never used. Unlike the Otis there are no time limits, and it does not require reading. In other words, it differs markedly from the Otis. In this kind of problem solving situation, the rate of increase for the high-anxious children is greater than that for the low-anxious children. The Davis-Eells and the Otis are highly correlated with each other and apparently the two tests have a lot of overlap in terms of what they are measuring. Despite this correlation between the two tests, we got these contrasting kinds of findings. We have found the same thing to be true with college students.

Our conception of anxiety is such that the situation in which the high-anxious child will be at the greatest disadvantage is one in which he has to decide for himself how and when he is going to respond. In other words, this is a situation in which the decisions are his, with no cues from the examiner, in which he has to act independently and creatively. It is in this kind of situation that the high-anxious child is at the greatest disadvantage. The anxious child is a highly dependent child in the sense that how well he does is a function of *how* things are presented to him and *what* is presented to him. He is a child who is concerned with what is right and wrong. The right and wrong are defined by the child in terms of what other people think is right and wrong. So when he has to act for and by himself, when he has to make his own decisions about what is good or bad, right or wrong, the anxious child shows up at greatest disadvantage.

We demonstrated this by putting the child into a situation in which the instructions were: "I'm going to show you some cards which have ink blots on them. I want you to look at the cards and tell me the different things which you see. Some people see this, some people see that. There's no right, there's no wrong. You look at the cards, tell me the different things that you see. Remember, there's no right and no wrong." Again, using our matched pairs, we found that significantly more of the high-anxious children cannot respond at all. This is not a matter of their responses being good or bad. Significantly more of them cannot respond *at all* to at least one of these ten cards. This was just as true for the bright anxious child as it was for the average anxious child. The other finding was that the *quality* of the responses of the low-anxious child was significantly better than that of the high-anxious child. I'm emphasizing this because the most objective, blatant indicator of interference in functioning is when one cannot respond at all.

Adult Sensitivity to Children's Anxiety

In the first year of our studies we asked teachers to rate every child in their class, in terms of demonstrations of anxiety in the classroom. This was a study based on 2200 children. The children had our anxiety scales administered to them as well as various kinds of standardized tests which had been routinely given. We found there was a significant relationship between a teacher's rating of a child's anxiety and a child's own rating of his anxiety. However, the correlation between teacher and child ratings, while significant, was relatively small. Of more interest, however, is the fact that in the second grade the correlation between a teacher's ratings of a child's anxiety and IQ or achievement was between .40 or .50, which is relatively high. In the third grade the correlation was somewhere between .20 and .30; in the fourth grade it was somewhere between .10 and .20 and by the time you get to the fifth grade there was practically no correlation. That is, the teacher's rating of anxiety becomes increasingly unrelated to a child's IQ or achievement.

Now if you ask about the relation between a child's own rating of anxiety and IQ and achievement, you get exactly the reverse. As you go up the grade, the child's own rating of his anxiety is a much better predictor of his achievement and IQ than is the teacher's rating of anxiety. This might suggest that as a child gets older he is learning to hide whatever anxiety feelings he may have. It becomes more difficult for the teacher to discern manifestations of anxiety. The child may be quite aware of it, but this does not mean that the teacher is aware of it. The bright but highly anxious child is in a most unfortunate position. Teachers

have tremendous difficulty in associating anxiety and brightness. If a child is bright and remarks to the teacher how worried he is about a forthcoming test, the teacher pooh-poohs this and says he has nothing to worry about. This kind of teacher response is guaranteed to have no effect at all. Anxiety is peculiarly one of those experiences with which you cannot reason. So the bright child by virtue of being bright and having a good record, is going to be disputed, so to speak, by the teacher. What this child learns is that there is no sense talking with the teacher about this.

We interviewed mothers of high- and low-anxious children for about 1½ hours each interview. The mother and the father then rated their child on a relatively simple checklist of characteristics such as anxiety, aggressiveness, stubbornness and maturity. We interviewed only the mother, but the mother and the father filled out this checklist independently. Well, as we started to go over our interviews the differences we expected were not emerging to the degree that we anticipated. Fortunately, following each interview the person who interviewed the mother wrote down what he thought went on between him and the parent. This was "top of the head" kind of data and no more than two pages in length. We then gave these write-ups (not the interviews) to six judges with one question: Did the write-ups contain anything in them indicating that this mother was withholding information? We found that the mothers of high-anxious children were rated as significantly more evasive or defensive in the interview than the mothers of low-anxious children.

What the clinician was discerning (neither he nor anyone else collecting data ever knew whether the child was high- or low-anxious) was that the mothers of high-anxious children were very concerned about saying the right thing and not saying the wrong thing. In other words, they gave the clinician the feeling that they were holding back, that there were things they felt they should not say. This, however, is very similar to what I said before. The high-anxious child is one who is tremendously concerned about what is right and wrong. This is noted here in order to clearly differentiate two sources of test anxiety—what a child gets in this respect via the home and what is contributed via the school. In our conception, test anxiety is not something that is created in a school; it is something that a child brings, more or less, to the school and in that situation can be either made higher, lower, or kept at the same level.

Earlier I said we asked the fathers and mothers to rate the children. The ratings of the fathers differentiated between high- and low-anxious children in precisely the way we expected. The ratings of mothers did not even come close. When you think that so much of what we know in child development is a function of what mothers have told us, this result at least is a basis for feeling uneasy. It may be that both the

mother and the father are correct. Mothers see children at different times of day and in different kinds of situations than fathers do. It may very well be that this, in some way, may be related to the results. There is the obvious possibility that, insofar as the kinds of characteristics we asked parents to rate, fathers may be more dispassionate in this regard than are mothers. We have nothing conclusive to offer in terms of an explanation.

Implications for Education

One of the implications of our study has to do with the nature of school testing programs. Is it not somewhat surprising that nobody has bothered to ask about the effects of tests on children? In this unfortunate era of national merit examinations we have problem families in which all kinds of pressures are being exerted on the child, on the school, and by the school. Of course the poor child is in the middle here. We have not paused to ask ourselves two questions. What does this reflect about our culture? What price are we paying for the emphasis which is being put on test results? The other implication is that if you tell me the IQ you want the child to have, I will give him, depending on whether he is high- or low-anxious, the appropriate test. This is to say, the high-anxious child is particularly vulnerable to the nature of the test and how it is presented. Consequently, there are many children who by the usual standardized tests get scores which are not necessarily accurate reflections of their capabilities.

Let me tell you, however about one study in which we got an opposite result. We gave the child the Witkin Embedded Figures test. We said, "I'm going to show you a design for about ten seconds, then I'm going to take it away and show you another design. The first design is somewhere inside this more complicated one and I want you to find it." It is in this kind of situation that the high-anxious child does better than the low-anxious. Why is this? Let us look at the instructions that accompany this test: You say to the child, "I'm going to show you the design, then I'm going to take it away and show you this more complicated one. You have to find the first in the second. If you feel you want to see the first design again, tell me. I'll stop the clock and I'll show it to you. If you guess and you guess wrong, I'll tell you and I'll give you more time."

This is a situation in which the examiner is in effect telling the child, "I'm going to help you, not to the extent of telling you what the answer is, but I'm going to help you. If you do wrong, I'll give you more time." Interestingly, the high-anxious request to see the original design significantly more often than the low-anxious. In other words, they take advan-

tage of the offered support. Obviously if you can see it a number of times this is going to help in problem solution. Also they take many fewer guesses. They are just not the kind who guess. It's too dangerous to guess.

We are at a time now when everybody is finally getting concerned, at least the lay public, with the problem of talent. Again the problem of talent is defined by a test score. The kind of picture that I have attempted to describe for you in the case of the anxious child is one which makes independent, creative activity unlikely. Although a child may be extremely bright as defined by a test score, if he is a high-anxious child then there is a good chance that he is one who will be unable to utilize his potentialities in a creative, productive manner. What distresses me about all these talent hunts is that we are defining creativity, brightness, independence of thought, by a test score. Our results clearly suggest that for many bright but anxious children this is not the kind of people they are.

We see this on the college level. For example, graduate departments in any field spend a lot of time admitting students. They try to select people who are going to be productive in scholarly activities. The Graduate Record Examination, or the Miller's Analogies Test, is given for admission to graduate schools. If you get above a certain point, chances are you are going to be admitted and you therefore, presumably, have certain characteristics. If you do not get above a certain score, you do not have these characteristics and you cannot get admitted. People are chosen for the Ph.D. program because these are the ones who are going to be scholarly, productive, creative people. They are going to be the ones who publish and make the contributions to our society. The modal number of publications past the Ph.D. in this country is zero. We have gotten ourselves into the box of thinking that we can predict certain kinds of things on the basis of available tests. Frankly, I do *not* feel that the answer is, "let's get more and better tests," although I am sure much money is going to be spent in the development of these instruments.

I am here reminded again of a problem in mental subnormality. There is a body of research in which mentally subnormal children have been followed up five years after they have left school, ten years after, and in some cases up to twenty years later. These were children who were in special classes. All of them had IQ's less than 70. There is one item on which the bulk of these studies agree. When you follow these children in later life, it is hard to tell the difference between them and a control group of children who were in the same school at the same time but were not in a special class. One would not have predicted this. Again, if pupils are put into a special class, then we have a certain future laid out for them. For reasons we do not understand, however, they do not go along with our

stereotype. Here is a point that may have some relevance for curriculum.

This is an area in which we are interested and which we are now beginning to study. I would put it in this way: How do teachers present new material to a class? This is but a variant of the question, how do teachers differ in the degree to which they make it easy for a child to say, "I don't know," without feeling that he is being regarded as a fool? Our observations suggest that relatively few teachers can engender a social-psychological climate in the class in which a child can admit, "I don't know," without feeling that he is inferior and inadequate.

One of the problems that new Ph.D's face when they go to their jobs is they have to act as if they know it all. You cannot go to your colleague and say, "I don't understand this," because he would look at you and you would begin to feel that maybe that look is really what you are. It is hard for us to admit to our students, "This is an area in which I [illegible] be more proficient, but I simply am not." We make it equally difficult for them to admit the same thing.

This [illegible] crucial problem in the elementary school. To what extent do we make it possible for children to tell us that they don't know? Put in another way, it is crucial to make a child feel that he can say, "I don't know," as a means for insuring productive learning. We have observed teachers in their first presentation of new material, and they differ tremendously in how they prepare children for what is coming. It is a rare teacher who spends a good deal of time trying to make children feel that they can admit to not knowing, to not understanding, without feeling that the teacher or his peers are going to derogate him.

The Shaping of Motives for Learning

RICHARD ALPERT

Education has an *obvious* responsibility with regard to the communication of content. Less obvious and perhaps more questionable is the responsibility which education must bear with regard to the social problem of intellectual apathy. To accept the first responsibility is to suggest that it is within the scope of educational goals to add or subtract from the body of knowledge which an individual carries away with him from his educational experience. To accept the second responsibility is to hold that education can affect, in addition, those characteristics of an individual that might lead to intellectual apathy or indifference after the completion of his formal education. This argument would seem to suggest that educators have a responsibility for instilling within the population via mass education a set of *values, attitudes* and *motives,* which would insure an intellectually aware, alert and curious citizenry.

In determining the wisdom of placing such blame and responsibility upon the educational institution in our society we must examine: (a) how much the inculcation of values, attitudes and motives is a justifiable component of the educational process; (b) what values, attitudes and motives we are transmitting via current educational practices; and (c) what an educational experience conceivably could do or be expected to do toward the reduction of intellectual apathy. We must defer to the educational philosopher for the answer to the first question. If he accepts the tenet that

the educational institution in a society must not only educate an individual in the content-sense, but must teach him as well to value education and to want to act like an educated man, then he will have defined a set of goals for education which we must implement and help to realize. Because I believe that leading educational philosophers would, and indeed do, support these goals (4,13,44), I feel it is indeed justifiable to attend to the latter two questions: namely, what are we *presently* doing toward the realization of these goals, and what *could* we do?

Educational Goals

First, let us spell out a bit more specifically the nature of the desired goals or educational outcomes. These have been stated in a variety of ways by writers both in education and psychology. The citizen-product of education should: (a) show intellectual curiosity, (b) value and want to make logical and rational decisions, (c) value and want to gain mastery through understanding, and (d) enjoy working with problems, so that (1) he looks at his environment in such a way that he brings problems to light, (2) he responds to problematic aspects of the environment in preference to others, (3) he remains in the field in which the problem is present, that is, he does not daydream, change the subject, etc., (4) he gains pleasure from the process of problem solving as well as from the final solution itself, and (5) he weighs alternative solutions in terms of their adequacy, rather than immediately accepting an easily obtained solution. He is not content with inelegant solutions. In effect, this citizen-product looks at his world, wonders "Why?" and gains satisfaction from finding out. What is most important, however, is that these motives be internalized, self-initiating, and self-rewarding.

Let me quickly point out that these values and motives are not alien to our present educational process. A good number of students *do* develop the desired motives and values. Observational data of most classrooms will provide numerous instances of the presence of such values and motives. My concern is rather with whether or not our educational program is geared toward increase in the strength of these motives, and whether or not techniques for strengthening them are not appearing in the classroom in far too helter-skelter a fashion.

For example, in comparative content analyses of mathematics texts which we are carrying out under the auspices of the School Mathematics Study Group at Yale (2), we found in addition to differences in the suggested function of mathematics, the cognitive mode, and the feedback strategy, that the 7th grade texts differ significantly in the motives and values which we assume to be already strongly operative in the child. For example, one text emphasizes the child's interest in traveling, in com-

p ing batting averages, in buying things, in fire alarms. This text apparently appeals to motives of mastery in concrete immediate situations. The other text, geared to a child of the same age, appeals to an entirely different set of motives, to the intrinsic gratification derived from using one's mind. That is, it appeals among other things to a motive to think and to meet intellectual challenge, to satisfy curiosity about matters not presently in the child's experience. Now it seems reasonable to ask such questions as: What effect does gearing texts to various motives and values have on a child's own motives and values, and is it enough to assume the presence of a motive to have it exist?

There are many such unanswered, and, in fact, often unasked questions related to educational curricula. Because these questions have not been asked in any systematic fashion, the educational picture appears, at present, to be somewhat of a motivational "hodgepodge." Perhaps a brief survey of some of the possible motivational difficulties in current educational practice would help to pave the way for further considerations.

Due in part to the present structure of educational institutions, and the limitations of financial support for research, education has placed great emphasis on relatively short-term goals. That is, there are relatively few efforts to evaluate the effects of an educational system in terms of long-range or longitudinal studies, which extend over any period longer than a single school year (38). Because we look for effects at the end of a school year, the nature of the evaluative criteria is necessarily limited. It is obvious that the evaluative criteria which we select because of these practical considerations affect our estimate of the methods which appear to work. This may be penny-wise, pound-foolish! It is quite possible that the factors that lead to the realization of short-term goals may not only *not* work with regard to long-term goals such as those with which we are now concerned, but may, in fact, be *detrimental* to the realization of these goals. The fact that an incentive is immediately effective is no proof that it is good (20).

A somewhat analogous problem concerns the use of reward techniques. As one looks at the American educational system, he gets an impression that educators most often are trained by their students to use the most effective reinforcers, the reinforcers that work. Granted that with the advent of Dewey there was a shift from negative reinforcers such as a birch rod or cane, which suppressed behavior, to positive reinforcers, still, as one writer suggests, "a change has been made not from aversive to positive control, but from one form of aversive stimulation to another. The child at his desk, filling in his workbook, is behaving primarily to escape from the threat of a series of minor aversive events—the teacher's displeasure, the criticism or ridicule of his classmates, an ignominious showing in the competition, low marks, a trip to the office

'to be talked to' by the principal, or a word to the parent who may still resort to the birch rod. In this welter of aversive consequences, getting the right answer is in itself an insignficant event, any effect of which is lost amid the anxieties, the boredom, and the aggressions which are the inevitable by-products of aversive control" (40).

While this author may be painting an excessively negative picture, it *is* true that because of the pressures on a teacher, he is still inclined to use the techniques that work most efficiently. He will continue to do this as long as his major goal is the communication of content. I would suggest that the most efficient techniques of control may have attendant difficulties. First, undue emphasis is placed on tensional motives. Second, playing upon the major motivations (which are primarily social) which the child brings to the situation tends to strengthen these motives and leave other, more desirable, long-term, nonsocial motives unexercised. Third, using social motives (which are often anxiety-laden) for reinforcing the learning of content often has side effects. Numerous studies (3,12,35) show that when children learn material in an emotionally charged social situation, where the social risk and pay-off are high, there is often evidence of learning blockage, debilitating anxiety, conformity of behavior, and emphasis on facts rather than on analysis and abstraction—a cognitive state of affairs which tends to limit the educational flexibility of the student.

Classroom Interaction

During the past few years in a project under the direction of P. S. Sears of Stanford (38) we have been working on an empirically derived method for systematic observation of classroom interaction. The data we have collected to date indicate marked individual differences among teachers in the nature and frequency of the techniques of control which they use and in the nature of what it is that they reinforce. Some findings derived from the use of this instrument will be noted later. Here I would only point out that for all teachers a large percentage of the control was carried out through social reinforcement—social shaming, class approbation, personal approval, etc., and rewards were given for following directions, being correct, performing up to a standard of excellence, etc.

If we look at these behaviors which elicit reward, we are struck by how general they are, that is, how little they are intrinsically related to intellectual endeavor. The child may learn that following directions, being correct, performing up to a standard of excellence, etc., are desirable behaviors, but there is no apparent reason why such desirable behaviors should be intellectually linked in noneducational settings. Thus, for example, rewarding the student who is highly motivated to achieve may, and usually does, make him a good student when he is in school. We know,

however, that in our society an individual concerned with achievement can achieve direct gratification in ways which are not at all related to intellectual behavior. Then, if the school has nurtured this motive through reward, it has done little to assure the continuity of *intellectual* endeavor after graduation. This would suggest that possible motives and behaviors more intrinsically related to intellectual endeavor should be rewarded in the schools.

Another motivational difficulty in current educational practice would be that incentives gain power primarily through the authority of the teacher rather than through the direct relationship between the task and goals of the learner. There is a constant external agent of gratification. It would be foolhardy indeed to anticipate that in another situation, outside the school, where the teacher is absent, the same motives would be operating. A study by Bennett (7) nicely demonstrates this fact. She was able by persuasion techniques to get 90 percent of an experimental group to volunteer (raise their hands) to participate in an experiment. These students were in the classroom at the time that they were persuaded to volunteer. In contrast, with the control group, and no persuasion, she got only 10 percent to volunteer. She found, however, that when the time came for the experiment, only 10 percent showed up from the control group and 10 percent from the experimental group. Though people were willing to raise their hands in the classroom situation, this enthusiasm did not carry over or transfer into their behavior outside the classroom.

We have given only brief consideration to some of the desirable motivational and value goals, and examples of some of the difficulties in present-day educational procedures. Let us now turn to an attempt to formulate, on the basis of current motivational theory and research, an educational procedure which could, conceivably, be expected to achieve the desired motivational and value goals.

Motivational Program for Education

In order to understand the plan that is being proposed, the reader must first understand the theoretical assumptions that I am making. The writer is here treading on theoretical territory fraught with controversial landmines. In fact, there is hardly a statement in the remainder of this paper with which some psychologist would not take exception. With that warning, let us proceed to examine the ten theoretical assumptions underlying the motivational program for education that I should like to propose.

1. *Definition of Motivation.* First of all, let me theoretically define a motive as something which serves to energize, select and direct the behavior of an individual (9). There are, of course, other criteria for

such a definition, but they will not concern us here. I should also mention that I am assuming that *all* behavior is motivated.

2. *Motive Hierarchy.* When the child enters the school system he has, in effect, a motivational hierarchy (19,23,28). This hierarchy of motives is based in part on an innate ordering—innate in the sense that a hierarchy or nucleus of one exists at birth or emerges as a function of maturation—and in part on previous experience, that is, earlier learning. This hierarchy is subject to reorganization. Reorganization can take place as a function of the satisfaction or satiation of the dominant motives in the hierarchy, as a function of the strengthening of weaker motives in the hierarchy until they supplant the more powerful ones, or as a function of sublimation, that is, redirection of the energies of the higher motives into the lesser motives. Evidence further suggests that the dominant motives in a motivational hierarchy are social in most instances and are aversive or tensional in nature. They are drives directed toward the reduction of an unpleasant state of affairs. Only those motives which appear lower in the hierarchy seem to be positive or appetitive, i.e., concerned with approach behavior or gratification through the gaining of a pleasant incentive.

The entire issue of positive versus negative motivation is indeed a controversial one. Reference works by White (43) and Miller (27) are excellent presentations of the alternative views. I believe that there is ample evidence at the present to allow us to accept the existence of innate positive as well as of innate negative motives.

3. *Multiple Determinants.* Each motive has connected with it a set of behaviors which the child is most likely to acquire if that particular motive is dominant in his motivational hierarchy. These many responses for each motive are in turn hierarchically organized. Some of them are more likely to occur than others in any given situation (29). Despite this apparent specificity in the link of behavior to motives, it [illegible] also clear that the same behavior often serves more than one motive simultaneously. For example, eating smoked oysters at a party may satisfy [illegible]'s hostess and one's hunger simultaneously. Therefore, we assume that any behavior can be in the service of one or more motives, and in its linkage to a motive, it may or may not be the dominant (most probable) behavioral response connected with that motive.

4. *The Shaping of Behavior.* There is now ample evidence presented by Skinner (40,41) and many others that it is possible to change the nature of probability of the occurrence of behavioral responses through judicious control of the environment. Such shaping of behavior is largely dependent upon the nature of [illegible]tion of the child and the proximity of the satisfaction of th[illegible] the performance of the desired behavior. The nature of the [illegible] reinforcement, the frequency of its

presentation, the time lapse between the response and the reinforcement are major aspects of the situation and affect the speed with which a behavior gets developed or shaped in the child. It is, furthermore, evident that the shaping of behaviors is fundamentally a reorganization of the response hierarchy, that is, it is a technique for making one response prepotent to other behaviors previously associated with gratification, of the motive.

5. *The Strengthening of Positive Drives.* We know surprisingly little about the teaching of motives. We have a number of theories regarding the manner in which a new motive is acquired or a weak motive strengthened, but the present evidence does not warrant any strong conclusion about this matter. Briefly the various theories are as follows:

a. *The Theory of Emergence.* According to this theory, a weaker motive will become dominant in the environment when the more powerful motives have been satisfied. Therefore, one strengthens or increases the effectiveness of one motive by satisfying other motives (23,43). This theory is at the basis of the teachings of John Dewey, for it suggests that the motives which we have proposed as desirable goals, such as curiosity, will emerge and thereafter be strong in a socially supportive environment.

b. *The Theory of Association.* According to this theory, a drive is acquired or strengthened through its association with another more powerful (more primary) drive. For example, the motive for dependency is built up through a link with the hunger drive. The sequence is somewhat as follows: the infant is hungry and experiencing a state of discomfort. Every time he is fed and the tension reduced, his mother is close by. As a result of this connection between mother and tension reduction, and between absence of mother and the presence of tension or dissatisfaction, the infant develops a strong desire to be near mother. This we characterize as a dependency drive. Once this drive is developed, it may be elicited by any type of tension or fear, which leads the child to seek his mother (16,29,30). It also has been argued, and rather effectively, that in humans, a secondary or acquired drive such as dependency, if it gets strong enough, becomes highly resistant to extinction, i.e., functionally autonomous, even though it may no longer be linked to the primary drive on which it was originally built (1).

c. *Affect Theory.* This theory is based on the argument that we approach things that have a positive affective or emotional tone and avoid things which are negatively emotionally toned. Therefore, to the extent that affect or emotional tone is linked to an object, the individual will be motivated to seek that object in order to experience the resultant affective state. According to this theory, cues in the environment which elicit appetitive behavior are really cues which tell the individual, "If you do thus and so, you will feel good." A new motive may be developed then, by linking the desired behavior to an affective state (11,24,32).

d. *The Theory of Dissonance or Disparity.* This theory is based on the assumption that disparity or incongruity between two attitudes or two actions

which are in some way juxtaposed in the same action system creates tension. There is an underlying motive in an individual to reduce the degree of this inconsistency. Thus, the presence of dissonant or disparate things in an individual's psychological environment motivates action to reduce this dissonance or disparity (18,34). When we apply dissonance theory to the study of human personality, there is some difference of opinion between various theorists as to whether or not discrepancies are cognitive, affective or possibly both. At present the lack of definite evidence in support of any *one* prevents a final selection.

e. *The Theory of Exercise.* Finally we have a theory regarding the strengthening of positive motives which suggests that because positive motives lead to behavior which provides intrinsic gratification, the mere provision of opportunity for behaviors to occur in the service of these motives will tend to strengthen the motives (8,43). For example, if the teacher is able to say, "come, look and see," and the children are able to "see" and therefore to get gratification for looking, the children will want to "look and see" in the future. Thus the sheer frequency of repetition of behavior performed in the service of a particular motive would be sufficient, through its self-strengthening mechanism, to increase the potency of that motive in the child.

These five theories provide our best source of a practical plan for the development of motives. We cannot, at present, choose from among them, but fortunately we need not, for they are not mutually exclusive. We shall, therefore, in the absence of data supporting one of these theories rather than another, use all of them, simultaneously or sequentially, insofar as that is possible.

6. *Values.* No environment or behavioral context is ever free of values—of conceptions of the desirable in behavior. These values, as cultural directives, have the effect of supporting certain behaviors and inhibiting or suppressing others. Sometimes the directives are explicit, such as, "Keep off the grass," and sometimes they are less explicit, but nevertheless clear. As a result of such a directive, for example, children realize that there are certain appropriate behaviors to perform in certain situations. This argument has been brilliantly demonstrated in a book by Barker and Wright called *Midwest and Its Children* (6) in which they illustrate how a child's behavior varies as a function of the ecological setting or cultural context in which he acts.

While these contextual values serve as situational determinants of immediate behavior, environmental values can sometimes have more long-range effects. We are finding out a great deal about a process called "identification," whereby one person incorporates a set of values held by another. This process seems to be largely dependent upon the nature of the affective relationship between the two people (10,22,29). For example, a child incorporates certain parental values, not by any direct instruction, but rather by a covert motivational process—the motive to

identify. If the nature of the relationship is appropriate, the child seems motivated to become "like Daddy" or "like Mommy."

Thus environmental values play a double role in our theoretical proposal. First, they offer situational information which provides evaluative directives for immediate behavior. Second, they may, under certain conditions, offer more personal information which may become incorporated into the personality of the individual and may provide directives for more long-range behavior.

7. *Mood.* There is both experimental (32) and clinical evidence to indicate that the kind of mood or affective experience associated with the learning situation is significantly related to children's attitudes toward intellectual endeavor, e.g., "math is dull," "math is exciting," "math is boring," "math is fun"(31). Whether or not mood turns out to have causal import in attitude formation, or to be merely a concomitant indicator of attitude, we shall, in view of its statistically significant relationship to attitude formation, include it in our thinking.

8. *Expectancy.* Whether or not gratification is sought for a specific motive in a particular situation will largely be a function of the strength of the drive within the child and of the expectancy of drive satisfaction. If either the drive strength or the expectancy is zero, then the child will not perform behavior pursuant to gratification of that drive (5). This suggests that through appropriate control of environmental cues we can make it more or less appropriate to perform behavior in the service of one drive or another.

9. *The Relation of Motives to Perception.* The evidence seems sufficiently clear that motives not only affect the performance of a child, but also his perception of the world around him. This is most marked in situations where aspects of the environment are ambiguous. Under these conditions motives tend to affect the selection of the objects in the environment to be attended to and then to affect the cognitive organization of these perceived objects.

10. *Self-Concept.* Finally we shall consider the self-concept as a cognitive configuration which could be considered as a neurological network or as a mediating theoretical cognitive structure. "As a result of interaction with the environment, and particularly as a result of evaluational interaction with others, the structure itself is formed—an organized, fluid, but consistent conceptual pattern of perceptions of characteristics and relationships of the 'I' or the 'me' together with values attached to these concepts."

"Most of the ways of behaving which are adopted by the organism are those which are consistent with the concept of self. Concepts of self function as guiding principles." The above quotations are drawn from

the works of Carl Rogers (36), one of the leaders in the work on self-concept. He, along with Mead, Cooley, Angyal, Lecky, Raimy and others, has long sought to label the self as a significant mediating process. For example, Raimy says, "The self-concept is constantly used as a frame of reference when choices are to be made. Thus it serves to regulate behavior and may serve to account for observed uniformities in personality"(36).

We shall argue that the self-concept is a stable configuration within the personality, and that the discrepancies from this self-concept have a motivating effect. This is consistent with a theory put forth by Helen Peak in which she says, "The self-concept is one example of an encompassing category which may provide common dimensions, or the whole that fits many concepts, percepts, attitudes, and other states in context with each other, so that when disparity occurs between perceptions and attitudes about the self, motivation is likely to be set up" (34). Because the self-concept is composed of affective as well as cognitive elements, it is possible that the disparity or dissonance could exist in any of these areas.

A recent study by Matire (34), in which he administered a projective test of motivation as well as measures of the actual and ideal self ratings provides interesting support for Peak's thesis. While Matire's results show no correlation between the motivation measure and either the actual or ideal self, he did find a significant correlation between the motivational score and the discrepancy between these two measures of self-concept. Thus a disparity between statements regarding the self was related to the amount of motivation an individual shows. At present this offers some support for the motivational thesis set forth by Peak. Peak's hypothesis of causality, however, is not tested by Matire's data.

A Curriculum Program

With these theoretical assumptions as background, we are finally in a position to outline a highly oversimplified motivational curriculum design for consideration. While I emphasize the motivational aspects of education, I hope that the reader will not think for a moment that I am not also concerned with the communication of content as well as with a variety of social and intellectual goals in education. I do not see any of these as mutually exclusive, but feel that because so much emphasis has been placed on content, it should be my duty as a motivation psychologist to counterbalance the picture.

This program is only a crude example of a sequential strategy in which we utilize all of the theoretical assumptions presented thus far. It should not be regarded as *the* program. If it serves as a catalyst to

increase attention directed toward motivational ends as well as means in education, the desired object will have been accomplished.

The child enters the school with a motivational hierarchy. The ordering of the motives in this hierarchy, as we have suggested, is the result of both innate and experiential determinants. It contains both positive and negative motives, that is, both appetitive and avoidance motives. The avoidance motives (though there are individual differences) are probably the dominant motives. For each of these motives there is a corresponding set of behaviors performed by the individual in his search for gratification or tension reduction. Some of these behaviors serve more than one motive.

When the child enters the classroom he is not aware that he can get gratification in the classroom for any of his motives. In fact on the first day of school he probably strongly doubts this. Therefore, it is the teacher's first duty to teach the child that she (the teacher) is an agent of gratification. In order to demonstrate this, it is necessary for the teacher to reward the dominant behavior, which reflects the dominant drive in the child. By gratifying the dominant drive she has, in effect, said to the child, "I am somebody to whom you can turn for gratification of your drives." For example, if the child is anxious and performs dependency-seeking behaviors such as touching the teacher's skirt, the teacher responds by hugging the child or putting her hand on the child's shoulder or in some way giving the child physical or psychological reassurance, that is, satisfying his dependency needs.

Once the teacher has communicated to the child that she is the agent of gratification, the next step would seem to involve the shaping of *behavior*. The teacher now rewards conditionally; she rewards the child only for certain desirable behaviors. This is the current technique used in education. In the early years we give praise for practically anything, but later on we raise our standards, or select the behaviors for which we provide the praise.

Now, what behavior is the teacher trying to shape? I would here suggest that she should select behaviors which may be in the service of the motives she desires to strengthen. Let us take as an example, curiosity motivation. Sometime during the child's school day, for some reason or other, he will most likely perform some curiosity-type *behavior*. While this behavior may be partly in the service of satisfying a curiosity motive, it may also be partly directed toward receiving the teacher's approval. Thus the behavior may be determined. Such a behavior would fulfill our criteria since it is a behavior which, while serving more than one motive, at least in part could be in the service of the desired motive. Thus the teacher now gives the dependency gratification that the child is seeking, but only for the performance of curiosity behavior (e.g.,

"Mary, I think it's wonderful the way you found out that answer"). We can anticipate, in view of considerable research evidence, that the frequency of the desired behavior will increase *if* the teacher is able to space her gratification-giving appropriately.

Now we have gone as far as most educators usually go in a motivational program, but according to *this* program sequence we are but half-way home. Previously, any curiosity behavior, even if the child had performed the curiosity behavior specifically to please the teacher, was rewarded. The next step is for the teacher to teach the child a *new* discrimination. This discrimination is that behaviors, *per se*, are not rewarded, but rather the *intent* behind these behaviors. That is, the teacher now selectively rewards behaviors which were *mainly* carried out for the desired motive. Now only the curiosity behavior which seems truly to be concerned with satisfying a curiosity drive is rewarded.

This step is aided considerably by verbal mediation. The teacher can teach this discrimination with words. For example, "Johnny, I think it's wonderful that you were interested enough in that word to go and look it up." Here the teacher is not only rewarding the *behavior*, but suggesting an appropriate *intent* for the behavior as well. Another child who looks up the word because he is asked to, gets less reward or at least a different reward.

Recalling our earlier exposition of the theories of motive strengthening, we can find in this step of our sequential program use of both the theories of association and exercise. This step demands, of course, that the teachers can differentially reward intent and/or behavior. Data collected in Sears' project (38) do indicate that there are marked inter- and intra-teacher differences with regard to what the teachers reward, and that we can discriminate in a reliably objective manner as to whether the teacher reinforces a particular child's (a) productions, (b) behavior, (c) intent, or (d) innate attributes such as personality and ability.

Simultaneously with the reward of intent, the teacher starts on another tack, that of modifying the child's self-concept in a specific direction. Shifting self-concept is not easy. Before such shifting is possible a child must feel sufficiently secure so that he can risk a modification in something as central as his self-concept (36). We are indebted for this bit of understanding to the therapy literature which, after all, is primarily concerned with the modification of self-concept. If a patient reports to the therapist that he holds a very negative self-concept, the therapist usually replies in a supportive way; he does not agree with the patient, but rather seems to say, "I accept you for what you are, but I am not impressed with the fact that you are as bad as you think." This often offers the patient sufficient support to allow for a re-examination

of what he really is, and to find out whether, indeed, he is quite as bad as he might have considered himself.

Can the teacher carry out a similar role in the classroom? From my own teaching experience it seems possible. If one treats a child as if he were a certain type of desirable person, one often can get him to act as if he *were* that type of person, and ultimately, if he feels secure enough, to actually become that type of person. What I do is to reward a student for being a certain type of person, or, more specifically, I reward him *with the assumption* that he *is* a certain type of person. "I like being with you because you are the type of person who is interested in so many things." How might we expect a person to react to a statement such as this? If he desires your attention, as a student usually does, he would not be inclined to say, "Well, actually I am not interested in anything."

I am suggesting that treating a child as if he were a certain type of person would lead him to try *being* that type of person. Through such rehearsal he would receive more gratification (from himself as well as from the teacher) which might well increase the strength of the motives connected with the new self-concept. Therefore, if the teacher can modify a child's self-concept so that, for example, he says of himself, "I am the type of person who is very curious," we are almost home.

This step, I suspect, can be accomplished not only by direct instruction, that is, by making statements to the child about himself, e.g., "You are a thus-and-so-type person," but also through the process of identification. That is, to the extent that the teacher has formed a close emotional relationship with the child and satisfies some of his social needs, she indeed could be an identification figure for the child, and thus her values, if they are clear, will be incorporated by the child. To the extent that the teacher states and believes the value, "A child who is intellectually curious and feels good when he satisfies this curiosity is good," she is providing the child with an ideal self-concept which she obviously values highly and which he might well incorporate. If, at the same time, she is responding to the child as if he were an intellectually curious person and is providing many opportunities for him to be that type of person, it is reasonable to anticipate that, barring severe anxiety in the situation, the child will move in the desired direction.

How will this new self-concept affect the child's motivation? We do know that children with high self-concepts perform better than equally intelligent children whose self-concepts are poor (39,42). Assuming that this relationship is directional or causal, that is, self-concept affects motivation, we must consider why this should be the case. If we are able to build into a child a statement about himself which says in effect, "I'm the type of person who enjoys making rational decisions, is intellectually curious, and so forth," then we expect that the child will perform appro-

priately when placed in situations that present opportunities for rational or curious behavior. But why?

To answer this question I can invoke the theory of Helen Peak (34) which works as follows: If a child is placed in a situation where his curiosity is aroused, and he takes no action to satisfy his curiosity, then he must accept the statement, "I apparently am the type of person who is not curious." This statement is discrepant from the self-concept which we have built into him, i.e., "I am a curious person." According to the Peak theory, this disparity would set up a motivation to resolve itself, and the resolution would change the statement which is most modifiable. Thus, if we can not only build a self-concept which includes the components which we desire, but also assure ourselves of its stability and resistance to change, we can anticipate that the child will reduce disparity by performing the necessary behavior to maintain the positive self-concept—that is, he will perform curiosity behavior so that he may continue to say of himself, "I am a curious person."

Yet what is to keep the child from not seeing the situation as one about which he might be curious? Here again we must utilize our learning theory, for the teacher can teach the child by the same process as the one outlined above that a person is valued who tends to see the world in terms of problems for solution and that, furthermore, the child is, indeed, such a person. If the child accepts and incorporates these values, they in turn will affect his perception of his environment. He will be motivated to perform perceptual behaviors to maintain the self-concept statement, "I am the type of person who tends to see the world in terms of problems about which I can be curious."

Finally, once the teacher has helped the child develop this self-propelling mechanism, that is, an intellectually-specific self-concept, she must wean the child from herself. This can be carried out by shifting the nature of the school experience in the later grades (probably high school) so that the child has ample opportunity to rehearse his new-found self-concept. Thus, the later grades should provide numerous opportunities for the child to perform rational-type decision-making or curiosity-type behavior and he should have the opportunity to perform these with little or no extrinsic gratification. Such a situation should minimize the use of extrinsic evaluative techniques such as grades, teacher approval, etc. Thus we would have an impersonal teacher operating in a more formal classroom in which there would be ample opportunity for the child to function solely for the gratification derived from performing the desired behaviors and *exercising* the desired motives themselves.

Thus by narrowing the alternatives, by diminishing the expectancy that other motives can be satisfied in the situation, and increasing the expectancy that the student can satisfy the desirable motives in school,

we are maximizing the chance for the occurrence and thus the strengthening of the desired motives in the educational setting. We are ultimately increasing the likelihood that these motives will become significant in the child's future.

Obviously such a program could never run flawlessly, partly because of the fact that the child is in the school but relatively few hours of his day and may well be living in a value culture which could be antithetical to educational ends (15,17,21,25,37). Nevertheless we have roughly 12 years in which to carry out this program and it seems reasonable that a systematic plan for the development of certain motives could be expected to be effective despite flaws if carried out over such an extended period.

Let us return to our original questions: "*Should* and *could* and *are* educators accepting some of the responsibility for overcoming intellectual apathy?" I would answer, "*Yes*," to all three of these questions. Educators have the right motivational goals, but they have lacked a systematic sequential motivational program. Such a program, if seriously researched and attempted, would, I believe, go far toward the reduction of intellectual apathy.

An individual who leaves school with a self-concept which includes statements such as, "I am the type of person who enjoys seeking information in order to make rational decisions," would be the type of person, I am sure, who would demonstrate desirable intellectual activity when decisions of importance were placed before him. Such a person might well be expected to study the issues in a political campaign, arrive at rational decisions and thus be most resistant to irrational persuasion techniques.

A society has come a long way when it provides for its citizenry as extensive an education as does ours. We must remember that such an extensive period of a person's life as is dedicated to education must be used always as wisely as possible. Wisdom would suggest that it be used for more than one purpose—not only for the communication of content, but for the development of motives which would serve the person well after the completion of his formal education. Active motivational planning rather than academic social criticism would seem to be the more direct path to the continued development of an intellectually enlightened populace.

References

1. G. W. Allport, "The Functional Autonomy of Motives." *American Journal of Psychology*. Vol. 50; 1937.

2. R. Alpert, "School Mathematics Study Group Curriculum: A Psychological Evaluation." Progress Report No. 1. January 1960. (Mimeo.)

3. R. Alpert and R. N. Haber. "Anxiety in Academic Achievement Situations." *Journal of Abnormal Social Psychology*, 1960. (In press.)

4. R. D. Archambault. "The Concept of Need and Its Relation to Certain Aspects of Educational Theory." *Harvard Educational Review*. Vol. 27; 1957.

5. J. W. Atkinson. "Towards Experimental Analysis of Human Motivation in Terms of Motives, Expectancies, and Incentives." In: *Motives in Fantasy, Action and Society*. New York: D. Van Nostrand Company, Inc., 1958.

6. R. G. Barker and H. Wright. *Midwest and Its Children*. Evanston: Row, Peterson and Company, 1955.

7. E. B. Bennett. "The Relationship of Group Discussion, Decision, Commitment and Consensus to Individual Action." Unpublished doctoral dissertation. Ann Arbor: University of Michigan, 1952.

8. D. G. Beswack. "A Thematic Apperception Test of Curiosity." SMSG Pilot Study Report No. 1. Harvard University. (Ditto.)

9. R. C. Bolles. "The Usefulness of the Drive Concept." In: Jones, Editor, *1958 Nebraska Symposium on Motivation*. Lincoln: University of Nebraska Press.

10. U. Bronfenbrenner. "Freudian Theories of Identification and Some Derivatives." *Child Development*. Vol. 31; 1960.

11. J. S. Brown and I. E. Farber. "Emotions Conceptualized as Intervening Variables." *Psychological Bulletin*. Vol. 48; 1951.

12 J. S. Bruner and A. J. Caron. "Cognition, Anxiety, and Achievement in the Preadolescent." APA Symposium on Achievement Motivation and Achievement Anxiety in Children, 1959.

13. L. J. Cronbach. *Educational Psychology*. New York: Harcourt, Brace and Company, Inc., 1954.

14. L. J Cronbach, K. Spence and R. Alpert. "Motivation." Ditto prepared for Woods Hole Conference, 1959.

15. A. Davis. *Social Class Influences upon Learning*. The Inglis Lecture. Cambridge: Harvard University Press, 1948.

16. J. Dollard and N. E. Miller. *Personality and Psychotherapy*. McGraw-Hill Book Company, Inc., 1950.

17. Elizabeth Douvan. "Social Status and Success Strivings." *Journal of Abnormal Social Psychology* 52:219-23; 1956.

18. L. Festinger. *A Theory of Cognitive Dissonance*. Evanston, Ill.: Row, Peterson and Co., 1957. 291 p.

19. H. F. Harlow. "Mice, Monkeys, Men, and Motives." *Psychological Review*. Vol. 60; 1953.

20. E. R. Hilgard and D. H. Russell. "Motivation in School Learning." In: *Forty-ninth Annual Yearbook of the National Society for the Study of Education*. Chicago: University of Chicago Press, 1950.

21. A. D. Hollingshead. *Elmtown's Youth*. New York: John Wiley & Sons, Inc., 1949.

22. H. C. Kelman. "Compliance, Identification and Internalization." Unpublished manuscript. Harvard University, 1960.

23. A. H. Maslow. *Motivation and Personality*. New York: Harper and Brothers, 1954.

24. D. C. McClelland, J. W. Atkinson, R. A. Clark and E. I. Lowell, *The Achievement Motive*. New York: Appleton-Century-Crofts, Inc., 1953.

25. D. C. McClelland and others. *Talent and Society*. New Jersey: D. Van Nostrand Company, Inc., 1958.

26. D. C. McClelland. "Methods of Measuring Human Motivation." In: J. W. Atkinson, Editor. *Motives in Fantasy, Action, and Society*. New Jersey: D. Van Nostrand Company, Inc., 1958.

27. N. E. Miller. "Liberalization of Basic S-R Concepts: Extension to Conflict Behavior and Social Learning." In: S. Koch, Editor. *Psychology: A Study of a Science*. New York: McGraw-Hill Book Company, Inc., 1958.

28. N. E. Miller and others. "Graphic Communication and the Crisis in Education." *Audio-Visual Communication Review*. Vol. 5; 1957.

29. N. E. Miller and J. Dollard. *Social Learning and Imitation*. New Haven: Yale University Press, 1941.

30. O. H. Mowrer. "Anxiety-Reduction and Learning." *Journal of Experimental Psychology* 27: 497-516; 1940.

31. D. P. Nowlis and A. Cohen. "Communication of Affect." SMSG ditto.

32. V. Nowlis. "The Development and Modification of Motivational Systems in Personality." *Symposium on Current Theory and Research in Motivation*. Lincoln: University of Nebraska Press, 1953.

33. V. Packard. *The Hidden Persuaders*. New York: David McKay Co., Inc., 1957.

34. Helen Peak. "Attitude and Motivation." In: M. R. Jones, Editor. *1955 Nebraska Symposium on Motivation*. Lincoln: University of Nebraska Press.

35. J. V. Pierce and P. H. Bowman. "The Educational Motivation Patterns of Superior Students Who Do and Do Not Achieve in High School." Ditto of Final Research Report, University of Chicago.

36. C. Rogers. *Client-Centered Therapy*. Boston: Houghton-Mifflin Company, 1951.

37. B. Rosen and R. D'Andrade. "The Psychosocial Origins of Achievement Motivation." *Sociometry*. Vol. 22; 1959.

38. P. S. Sears. "Problem in the Investigation of Achievement and Self-Esteem Motivation." In: M. R. Jones, Editor. *1957 Nebraska Symposium on Motivation*. Lincoln: University of Nebraska Press.

39. P. S. Sears. "Accuracy of Self-Perceptions in Elementary School Children." Abstract of paper presented at California Educational Research Association meeting, 1959. (Ditto.)

40. B. F. Skinner. "The Science of Learning and the Art of Teaching." *The Harvard Educational Review*. Vol. 24; 1954.

41. B. F. Skinner. "Teaching Machines." *Science*. Vol. 128; 1958.

42. R. L. Spaulding. "Differential Effects of High and Low Self-Concepts Regarding Mental Ability upon Academic Achievement." Paper presented at California Educational Research Association, 1960. (Ditto.)

43. R. W. White. "Motivation Reconsidered: The Concept of Competence." *Psychological Review*. Vol. 66; 1959.

44. Asahel D. Woodruff. "Motivational Theory and Educational Practice." *Journal of Educational Psychology*. Vol. 40; 1949.

The Group Contributes to the Individual

HERBERT THELEN

The question of what the group contributes to the uniqueness of the individual is a difficult one. Uniqueness is something like happiness: it is a by-product of the way people live and learn. What are some of the conditions under which uniqueness would be likely to be maximized in a group? Let me begin by spelling out certain aspects of the complex classroom situation by means of researches that illuminate rather crucial points.

First, I would like to describe a simple assessment situation which gives us some idea of the variability with which we are working. For example, we studied a group of 50 sophomores. In social studies they concentrated for three weeks upon revolutions. They studied three or four revolutions and then it became time to test their knowledge. The teacher made out a test that treated history and economics. I said, "Why don't we try to find out something about what revolutions mean to these youngsters?" We tore pictures of the Russian Revolution out of *Life* magazine and said: "All right, you've been studying about revolutions. Here's a snapshot of a revolution." We then gave them the instructions: "What do you think happened before, what's going on now, and how's it going to turn out? Make up a story."

One girl wrote: "This picture shows the poor, downtrodden, unhappy peasants. The mothers are worried because they don't know how they're

going to feed the little ones, the fathers have been taxed to death by the dictator and are in jail, the brothers are hiding in the hills to avoid military service, it's pretty bad. How's it going to come out? No good." That was her story. A 14-year-old boy, who was a problem youngster, produced the following: "There are four basic causes of revolution: economic, political, social and religious." A third boy was well supplied with the kind of creativity the teachers could do without; he was always finding holes in things and was compulsively different. He wrote: "This picture shows the common herd milling around the base of the palace of the king. The king is a wonderful man. Gentle, kind, educated, friendly, and he really wants to do well by his people but he gets bad advice from his government."

In a very different way these youngsters reacted, presumably, to the same unit of study. First, in showing variability and, second, in raising a rather interesting educational question. From one point of view this is only clinical data. The girl who is identifying with the bleeding and downtrodden is about at the same level of response as identifying with the animals on a Rorschach. As educators we can see that she needs to be able to see larger trends, to be able to see historical events not entirely in terms of identification with individuals but also in terms of social movements in the broader culture. Social studies serve her sensitivity to the downtrodden, with whom she identifies herself. When we look up her record, there is every reason to think she ought to feel downtrodden in view of her own life history. Then, there is the boy who does the opposite. He divorces himself completely from all of the personal, human events that he has been studying. He does not see history as something men acted and wrote; he sees it as a set of abstractions for flushing away the human adventure with a few words like economics and religion. Then we have the creative boy, wanting power, feeling contemptuous of other people and believing *he* could not fail.

Social-Emotional Climate

Are these themes in which children organize the meaning of social studies something a teacher ought to be concerned with? Should social studies help each of these youngsters: (a) to move toward more ability, to see the trends, the broader picture; (b) to realize that human beings are involved; and (c) to see that there are other dimensions than power around which human behavior can be understood? When we begin to look at the way youngsters utilize this in their psychic economy, we see a lot more than is seen in the usual achievement test.

In another study the immediate social experience in the classroom was seen to have some effect on meaning. This study was run informally.

The teachers in an eighth grade class were asked to identify five pupils they thought were best adjusted in the class and the five they thought were having the most trouble. The teachers did not reveal which youngster was which, but they sent all ten of them to the writer one at a time.

Again, I showed them pictures. These pupils were all taking math in the eighth grade so I would show them a picture and say: "You've been studying math. I want you to read into this picture all the mathematical ideas you can and tell me about them." After a while, I became aware of a distinct difference in the responses. One kind of student would look at the picture and say, "That's a country store." The first reaction was to name it, to identify the scene. Then this student would say, "If I were running that store I'd want to make a profit." I would say, "Fine, how do you calculate the profit?" And the student would give me a formula.

Other students gave a different response. The student would look at the picture and say: "That's a country store." Then, after a pause, "Well, we studied business a couple of weeks ago and Miss Jones got into a discussion with the class and pointed out that the purpose of business is to make a profit." I would say: "That's interesting. How do you calculate profit?" and the youngster would tell me.

These two types of responses are exactly alike at the beginning and the end. Each started by identifying the situation and each ended by giving a formula which had been overlearned. But, look at the difference in between. The "best adjusted" ones put themselves directly into the picture and saw mathematics as serving their purposes. The "poorly adjusted" could edge themselves into the picture only by remembering extraneous details about the learning situation. Granted that this experiment needs to be replicated and done much more carefully, it nevertheless temporarily satisfies my prejudices that the availability of learning—what you do with it, how accessible it is, how much you can reformulate it, how easily you apply it in new situations, how far you can separate it from irrelevant stuff—is strongly affected by interpersonal relations. So we can identify the social-emotional climate as having something to do with how the student will learn, how free he will be with learned material.

We tried another experiment to test some ideas about anxiety. This was done with graduate students by Jack Glidewell, who is now on the St. Louis County Health Board. Jack interviewed some college students and gave them Rorschachs and Thematic Appereception Tests. As he discussed things with each student, he attempted to discover the significant people in the student's life. If he were in a group of 20 people to whom would he pay attention, who would make a difference to him? In any large group there are certain people you are very much aware of and others whose presence goes unnoticed. So we tend to "collapse" the group to just a few persons who are key people. They are the ones whose eye you try

to catch when you are a little skeptical, the ones whose support reassures you.

One student Glidewell worked with appeared to be very sensitive on the score of his mother. The mother figure would be important to him in a crowd. He was also concerned about seductive females and dominant males of the strong, booming, aggressive type. He was also sensitive to effeminate males.

We decided to bring these people to life by training graduate students to act these roles. One was taught to be a mother, another to be seductive, another dominant, and the last "weak." The subject had named socialized medicine for the topic of discussion so we had two or three seminars to train ourselves to hold up our end of the conversation on socialized medicine. Our cast included the subject, the four role players, and six observers. Three of these were clinical observers looking for fidgeting, flushing and nonverbal cues. Three others had been trained in discussion leadership and were to watch the leader's style.

The results were clear-cut. The subject's reaction depended on *who* made the comment. For example, "Let's get together on this." Each of the role players at one time or another made this statement. When the dominant male said it, this fellow became very coherent, incisive and forceful. When the seductive female said, "Let's get together on this," he became incoherent. "Tell us what to do," was another statement used. When the mother said it, everything was serene, but when the effeminate male said it, the subject was lost.

Our subject had never seen these people before. If he had, he was not acquainted with them. So he was not responding in terms of full knowledge of these people as persons. He was responding to what was cued off by the roles these people were playing. The comments of the role players were only cues that opened the door to past experience, some of which obviously had not been assimilated. Thus leadership style is influenced by the particular interaction of the leader with each of these individuals. When the teacher, in responding to what a child says, loses the track, becomes anxious and incoherent, this is no longer a matter between the teacher and this child alone, because the teacher is there to teach the whole class. It is the whole class that now is presented with a teacher who simply does not know how to control himself in the situation.

The combination of the individual pupil with the teacher is important. Many teachers are quite aware of this and the more honest ones are able to say that there are certain individuals whose presence in the room makes teaching very difficult for them.

The experiments of Lewin, Lippitt, and White, in the late '30's, focus on the next questions about group climate or atmosphere. First, do such climates exist? Second, how can the teacher generate climate at

will? Third, which climates are healthy in the sense of freeing the child's energy for the learning task, saving him from preoccupation with other people, and with his own anxieties?

Teacher Style

Our first assumption was that what the teacher does, matters. John Withall, now at the University of Wisconsin, started to study what goes on in the classroom by means of tape recordings synchronized with time-lapse photography. When he played back the sound record and the synchronized pictures, he was able to reconstruct almost completely the situation as it had occurred. This enabled him to have almost total recall; he could relive his observer experiences in a classroom over and over. The study concentrated on the teacher. What are the things the teacher does? Can these acts be classified? How do they affect the response the pupil gives? As he listened to the teacher, he was saying, "What is this teacher really communicating?" He also asked the next question: "If I am right that the teacher at this point is being punitive, communicating threat and so forth, then the pupils ought to act in the next response like youngsters who feel threatened." This gave him at least a general category of response to look for to validate his impression of the teacher's intention.

The intentions condensed to six categories. One, the teacher is trying to *support* or build up the child's ego. Second, the teacher is trying to *clarify*, help the child understand better what he just said; help him dig a little deeper into his own meaning in the situation. Third, the teacher is trying to *structure* or define the situation, that is, pointing to elements that have to be taken into account. This does not mean telling the student how to do it, but simply helping the child understand the realities with which he is confronted. The fourth kind of intention was to *give orders*, but a lot of giving orders has two or three components. One component is that it is a way of defining the situation. Another component of giving orders is the communication, "I don't care what you want to do, this is what you're going to do!" It is in this sense of order giving that the category is intended. The next category was called *capricious criticism*, the kind of criticism to which the youngster sometimes responds with justice, "Why pick on me?" He does not quite know why at this time, on this occasion, he was singled out and is very likely not to know what is being held against him. All he gets is emotional evaluation. The sixth category we call *self-justifying*. This kind of comment is illustrative, "Well, that's a good idea John, but after all if you'd been teaching this subject as long as I have you'd realize you haven't got a leg to stand on." Basically, it is saying that when the teacher differs with the pupil he (the

teacher) is not interested in the respective merits of these viewpoints.

The six categories can be grouped under two headings. The first three seem to be responsive to the learner and his needs; the second three are primarily responsive to the teacher's needs for keeping people at proper distance, for building up his own ego or for reassuring himself.

Having defined these "learner-centered" and "teacher-centered" categories, the next step was to find out what differences they produce in classrooms. Ned Flanders, now at the University of Minnesota, tried to determine what goes along with these two kinds of climate. He worked with two teachers, one trained to make "learner-centered" comments and the other trained to make "teacher-centered" comments. These comments came easily to the teachers, tending to "fit" their respective personalities.

One student was brought in and after a while the first teacher started teaching. This went on for about 25 minutes until the pupil had learned what the teacher was trying to teach. Following the first teaching session the next teacher taught a lesson using comments from the teacher-centered categories. Of the principles learned under the learner-centered style of teaching, the recall at the end of four days was 100 percent. Of the principles taught during the teacher-centered period, the average recall was about 55 percent.

Certain remarks from the tape recorded teaching sessions were selected and scrambled. Added to this were a few "made-up" remarks—sheer fiction. Four days later the pupil was asked to put in front of each remark the symbol "S" if he had said it, the symbol "T" if the teacher had said it, and the symbol "X" if neither had said it. The pupil was very accurate in identifying remarks taken out of the teacher-centered period. The teacher was making self-justifying, critical, and directive remarks, and the student attributed them to the teacher. But for remarks taken out of the learner-centered period, the accuracy of discrimination approached 0. The pupil had a difficult time untangling the comments, deciding whether he or the teacher had said it. The discussion had been similar to two voices in the pupil's head since the teacher was working in the pupil's frame of reference. In the teacher-centered period the frames of reference of teacher and student were quite antagonistic.

Another thing done at the time of learning was to have the student operate a lever. His instruction was: "When you feel good about what's going on, pull the lever toward you, if you don't like it, shove it away." Thus we had a continuum of feeling, reported nonverbally during the lesson. The number of the positive feelings during the learner-centered period was greater than the number of negative feelings as registered by about 80 percent of students. Even more significant was the number of responses—either plus or minus—given in the two periods. It was about

50 percent as frequent in the learner-centered period as in the teacher-centered. This suggests that the awareness of having a feeling—of being conscious of self was much greater in the teacher-centered period. This leads me to propose that the teacher-centered teacher keeps the learner preoccupied with self and conscious of self to a much greater extent than does the learner-centered teacher.

We also obtained some physiological measures. The pupil was seated at a table looking at pictures with one hand on the lever. A silver electrode was attached to the pupil's palm and another one to his ankle. This enabled us to measure the respiration rate, heart beat rate, and the skin resistance. The two rate measures were higher for most pupils during the teacher-centered period. Skin resistance was, without exception, lower. Of the physiological indices, the most interesting thing was skin resistance. If one begins to sweat, the skin resistance goes down. That is, sweat being an electrolyte is a good conductor so the skin resistance drops. Now, sweating is a symptom of anxiety. If the skin resistance drops, one interpretation is that anxiety has gone up. With the teacher-centered kind of behavior you'll see that skin resistance drops irregularly, but rapidly. During the rest period it remains nearly the same. During the learner-centered period it recovers, but not completely. Presumably skin resistance is a little less susceptible to sentiment than something like "do you like this situation" or, on what you think the other person expects you to say. As a measure it is a little more fundamental, a little more involuntary, a little less under the conscious control of social or polite expectation; therefore, it ought to be fairly meaningful.

The responses of certain students were interesting. The teacher would make a comment and there would be a drop in skin resistance; but a few seconds later the pupil would pull the lever toward him, indicating good feeling. That pause between the registering of anxiety and the decision to pull the lever suggests the making of a conscious decision. So it seems that some of these pupils had learned to misrepresent the evidence of their own nervous systems.

Perkins carried the work a little further. He dealt with six groups of adults in Prescott's child study program. We selected three leaders whose general tendencies were learner-centered and three more who were teacher-centered. Perkins recorded ten meetings for each of the six groups. He had something like 30,000 comments of members and leaders to classify along some 50 or 60 dimensions. This is obviously more superficial but also much more extensive than the Flanders experiment. A number of interesting new things turned up. One was the close relationship between the pattern of comments of the teacher and of the members. Consider a teacher who is concerned with the students and their welfare, with problem structuring and reality orientation. In

a group led by such a person, the members reflect that kind of approach, too. But to a teacher whose devices are self-justifying and critical, the group responds in kind. The patterns of leader and group were almost identical. The teacher, himself, in some way sets the expectations and gives the cues. This is interesting because only the teacher had been selected as being different. So far as we know the groups were random in initial tendencies.

The task of these six groups was to study anecdotal records of children. There was much more hostility expressed toward the subjects of the case studies in the groups led by the teacher-centered teachers. Under the learner-centered teachers there were many more instances of using facts to back an argument. There were many more instances of insights—flashes. There was much more effort to relate what one person said to what was in a book or to what another person said.

Teachable Classes for Teachers

How do we learn to take account of the factors that influence the classroom situation? It is very difficult to change a teacher. But there is one thing we could do for teachers that might improve instruction tremendously without making any further demand on them at all. That is to *give them classes they can teach*—teachable classes. Suppose the teacher could feel that the class in front of him was understanding, enthusiastic, and could respond to his demands in acceptable ways. Suppose we could give teachers classes like that. It might bring about a considerable improvement in education.

Currently we are conducting an experiment in which each of 15 teachers is teaching two classes. One of the classes was composed for the teacher on an experimental basis while the other class was given to the teacher by the usual administrative routine. We are studying these classes for a year to see whether our way of composing classes makes any difference in the learning of children and the management problems. There are several bases on which we could have composed the classes. I have already indicated that ability grouping is questionable. Each teacher was asked to select from the previous year's classes the pupils for whom his work was meaningful—the ones who got a lot out of class. (This doesn't mean that they were necessarily the highest achievers.) Then they identified the pupils who had learned nothing or little. Each of these 15 teachers gave us anywhere from 10 to 20 students classified in these ways.

We tested these students with a three-hour test battery having 450 items. Each item had an average of four responses, making 1800 specific responses. Of these 1800 responses, which ones were significantly differ-

ent for the pupils who got a lot out of class as compared with those who got little? On the basis of these item counts, we made a key using items that discriminated between the two sorts of students selected by the teacher. We ran the papers through an electric scoring machine and picked out the top 30 pupils in the group available for a particular teacher. Thus we gave each teacher students like those she picked out as the pupils having good experience with her in her class.

We asked the teachers whether there are any differences between their experimental and control classes. One teacher said there is no difference, none at all. Another teacher discovered that all but two of his experimental pupils have higher IQ's than anybody in the control group. (We had not looked at IQ's.) Another teacher reported that the experimental class is a better class, but the range of IQ's is much bigger than in his control class.

Right now we are busy just looking and seeing what the differences are. It looks as though 12 of the experimental classes are clearly superior to the 12 control classes. It has taken 3 months for the superiorities to develop.

I would like to make a suggestion for a research study. In March, let us start a period of observation for two weeks, during which each teacher tries to identify students who get most and least from his or her classes. Then, let us get each teacher together with other teachers who know the same pupils and have them speculate about the difference between the students who Miss Jones says got most and least. Let the teachers, through a case conference, try to define what seem to be the differences between these types. They could then send the description to the teachers in the grade below, and say, "You've got the students Miss Jones is going to have next year. Please pick out the students who are like the image of the pupils who ought to go to Miss Jones. Also, pick out those you think best fit this picture of the pupils Mr. Brown ought to have." Let the teachers in the grade below do this, and then see if we can compose classes on this basis. I think it is possible we would have better classes this way. It uses the reactions of people who know the pupils, they are checking their judgments with each other, and they are doing a professional job of really looking at pupils. May I conclude by stating that if we had classes like this, that are really teachable, we would be doing a great deal more than at present to develop uniqueness in the individual.

The Learner and the Classroom Group

RONALD LIPPITT

What are some of the problems and some of the potentialities involved in the relationship between the individual learner and the classroom group? Several of our current classroom research projects have convinced me that this is a very practical curriculum research issue. At the same time consideration of this question offers an opportunity for making significant contributions to the general theory of education and to the basic disciplines of sociology and social psychology. Let us consider the following questions:

1. What is the situation that the pupil faces in developing and using unique personal resources, and at the same time learning to function as a good member of strong cohesive groups?

2. What are some of the problem solving patterns that individuals and groups adopt in coping with this problem situation of the relationship between the individual and the group?

3. How real is it to talk about a classroom group as having strong effects on the individual child's motivation and ability to learn? How real is this notion of a classroom group, of a peer culture group, as one having strong influences on the pupil's performance as a learner?

4. What seem to be some of the most important classroom conditions promoting a healthy pattern of relationship between individuality (and the development of individuality) and group cohesiveness?

5. What do these conditions seem to imply for teacher practices and teacher orientation?

6. What seems to emerge as some of the key issues for research on curriculum development in this area of inquiry?

1. *The Situation of the Individual and the Group*

Starting with the first question, what seem to be some of the basic issues of the situation of relationship between the individual and group? Let me mention briefly, as examples, three different points of view toward the dilemma:

a. There is a growing body of evidence that cohesive groups exert strong and pervasive influences on the opinions, the values and motivations, the behavior pattern and the self-conceptions of the members of the group. And, says this point of view, this is alarming because important individual differences in capacity and resourcefulness are being prevented from development and from actualization. This point of view holds that children are growing up in the same mold, that adults are more and more conformists. Individuals are being robbed of their birthright and democracy is being robbed of its human resources.

b. There is also a growing body of evidence that individuals are terribly in need of the freedom from what Adam Curle calls the neurotic anxiety of isolation from fellow men. At all age levels we need and depend on the acceptance of, the inclusion in, meaningful and strong groups. The pathological state of alienation or of nonbelonging, as described by Durkheim and others, is essentially an analysis of the sickness of nonmembership, of noninclusion in strong, meaningful groups.

c. A third concern, expressed by many in our society today, is that there is too little vigorous action by strong groups in the interests of community development, of national welfare, and of international collaboration. More and stronger groups are needed, more integrated groups, groups with greater commonness of purpose and discipline of membership in the devotion of energy to action.

These, then, present three rather contrasting points of view. Various value-laden phrases have been attached to them like groupism and conformism, on the one hand, and anomie, noninvolvement, beatnikia, on the other hand. All of these concerns seem to make important sense: the need for strong persons, the need for wide individual variability, but also the need for strong groups that command loyalty and energy of committed members.

Let us take a slightly different look at this same dilemma, or what appears to be a dilemma. Babies are born with a wide variety of basic differences. Some of the differences are clustered in two packages called male

and female. There is exciting current research on differences in skin sensitivity of girl babies and the relationship of this to getting a greater feedback from the nurturance of the environment, and of greater activity on the part of boy babies in getting into more contact with their environment more rapidly. There is a great variety of sex differences in activity, passivity, alertness and placidness. Also, almost immediately, the young boys and girls are treated differently, which is a process of creating more differences. Then maturation unfolds more differences. But the various socialization groups in society mobilize rather rapidly.

The family, the schools, other agencies have various images of what a good young one is, what a good learner is. We have identified some seven different socialization panels in most communities that have vested interests in socializing the young to make them good sons, good first graders, good college entrance risks, and so on. At the same time that the child is growing to be more on his own, to develop his own ideas, to use some of his unique conceptions of what and how to do it, he is being vigorously inducted into more groups with expectations of loyalty, requirements to do what others are doing and to be a good participating member.

Another fact is that he is a member of several different groups that require multiple loyalty and often have competing and conflicting expectations for him and for what he should believe. So, partly consciously and partly unconsciously, the child (like all the rest of us) is in a triple situation most of the hours of each day. He is in the situation of direct involvement in a face-to-face group of two or more of the moment, but also involved in several other non-present but psychologically potent groups. And third, each pupil is involved in a loyalty to his own identity, to the continuity and the growth and the protection of the self.

Step back for just a moment and think of this from the point of view of the groups to which the individual belongs. All groups are continually faced with members who are willing and able to give limited commitment and energy to the purposes and projects of that particular group in their personal distribution of time and energy. So there is, from the point of view of the group, very often considerable frustration about the limited commitment and energy available for the purposes and goals of the particular group.

Then there is the problem for the group that these members with so many different backgrounds represent different individualistic patterns deriving from their backgrounds of loyalty to other groups. So the group is frustrated by the continual pressures toward deviancy that discourage attempts to build and maintain a strong, effective group that will move toward group purposes. The group is faced with issues just as the member is faced with issues.

2. *Problem Solving Patterns*

Let us look first at some of the attempts at solution to the stresses of the relationship between the person and a particular group, such as a classroom group. The temptation for all of us, and certainly for young children, is to find as simple and clear-cut a solution as possible. We like to find simple, meaningful ways of resolving issues we are coping with. One frequent way of making the problem simple when faced with a conflict of personal inclinations and group expectations, is to say, "I am right and they are wrong." Making things into rights and wrongs or into goods or bads, is one of the simple approaches to solution. "I don't go along with them, I've got my own way, I value being different." This usually leads to isolation and rejection from the rest of the group. Usually there is a loss of influence on the group, the loss of potentiality for changing the ways of the group and for helping determine the kinds of things it will do and become. From the point of view of the individual we may call this the *simple independency solution.*

Another kind of solution is to say, "The group's right and I'm wrong. After all, who am I? I'm just one person; all of them must feel differently." We can refer to this type of personal assumption as a case of pluralistic ignorance.

We found, for instance, in working with 30 college fraternities on the question of admission of Negroes, Orientals, and Jews, that a majority of the men in all but one of the 30 houses were in favor of a change toward a more liberal practice. But in each house a large majority of the men believed that a great majority of the other fellows were in favor of the present practices. This was not defensiveness. These things were never talked about, were never communicated about because each individual, seeing himself in the minority, never raised the question of his position or belief because he assumed this would be sticking out his neck. Therefore, what the sociologists have called pluralistic ignorance maintained itself. A frequent way of coping with the conflict situation is to say, "They must be right because there are more of them. I'll go along with whatever clues I get about what's wanted because there's a right and a wrong here and I must be wrong." This we might call the *simple dependency solution.*

There is a third posture which appears quite often in this conflict situation. Rather than giving all the weight to the self or all the weight to the group the individual says, "Oh goodness; here's a conflict I'm caught in. I don't know what to do, the struggle's not worth it, I'll withdraw and become passive." This means to drop out of the group because of the strain between feelings of personal interest and of what seems to be wanted by the others, by the leader, by the program, or by the teacher. I know many children who have psychologically dropped out of the

classroom long ago. They are there physically but they have taken the *withdrawal solution.*

All three of these attitudes are simple kinds of solutions, psychologically, and I think we would agree they are relatively unhealthy ones to adopt as a posture throughout one's group life. There are more complicated solutions in which the individual assumes and the group also assumes that there must be *interdependence* between the welfare of the group and the welfare of the member, with mutual acceptance of the definition of responsibility and freedom. This we might call the *interdependent solution.* We will be coming back to it. It raises some questions about how far does one go as a group in compromising with deviant members; how far does one go as an individual in compromising with a stress on one's identity continuity.

Let us turn to the other basic situation. The one we have been considering is the relationship between the individual and the group. Let us look now at the situation of loyalty to several groups simultaneously. This is a fact of life for all members of the classroom. There is a loyalty conflict between the expectations of two or more memberships; for example, what mother wants, what friends want, and what teacher wants. What are some of the ways in which we try to cope with this?

One way is to close our eyes and say, "Well there's really no conflict. I'll do what the present group expects. It is the one I'm in right now and it's really okay with everybody." One might call this the *denial solution.* There is denial of conflict of interests or conflict of loyalty. One compartmentalizes effectively the relation, the expectation and standards of this group and that group; and switches from one to the other as one switches situations, always helping oneself to believe that the thing that is wanted right now is generally okay.

Then, there is a second posture which says one group is right and the other groups are wrong. As he goes from group situation to situation, the individual is guided in his behavior by his most potent reference group, the one he has chosen to be his major guiding group. It may be a reference group of peers, his gang, his best friend, or he may be guided by a strong basic loyalty relationship to parents. All others are wrong. "I'll give my energy and obedience to one and let this guide me through the dilemma of interaction with others." This orientation has many problems. We have seen the adult-oriented children having difficulty relating to peer groups. We have all seen the opposite, that of peer group-oriented pupils having difficulty relating to teachers and being at odds with adult expectations. We might call this the *dominant guide solution* as the way of making loyalty problems a bit easier. We find this frequently as we study cross cultural contact between visitors from another culture in this country or of Americans abroad.

There is a third posture that says, "They want different things, so to heck with both of them. This gives me license. I'll be independent of them both and do what I please." You might call this the *non-involvement solution,* getting out of the entanglements and commitments of stable loyalties. Much of the psychological analysis of the beatnik posture has been around this kind of meaning.

As in the interdependency solution previously mentioned, there is a more complex approach, which might be labeled a *creative deviancy* or *creative conformity solution.* In this approach the individual becomes an energy exerting influence on one group in terms of the wisdom learned from another. He is exploring the concept that if an idea or a value is good in one group it might be relevant and appropriate some place else. This implies responsibility to try to influence the groups that one is in rather than to accept passively the discrepancies that exist in their influence on me as a person. We will return to this problem of creative conformity, but let us turn for just a moment from the individual's problem and viewpoint to the outlook of the group. Let us look at the world through the eyes of groups confronted with the fact that all members, such as pupils in a classroom, are only partially involved in this particular group and often are deviant in their inclinations because of their self-interests and their other group loyalties. The particular group says, with as much vigor as it can, "They, the members, owe loyalty. We have a right to require it. The group exists for their welfare." One kind of solution to the threat of partial loyalty, from the point of view of the group, is to develop strong conformity demands, loyalty tests, leadership strength. We might call this a *leader centered* or a *group authority centered* solution. The group comes first.

Other groups have a different solution. The group says in essence, "Well, maybe our only purpose in existence as a group is to facilitate people going their own way. Maybe we should not get involved in the pain of pushing for any group demands and goals. Let's just take it easy." This you will recognize as a *permissive* or an *anarchic* solution.

There is a more difficult and a more disciplined solution from the point of view of the group; a solution which recognizes that there is a legitimate and necessary balance between group welfare and individual autonomy welfare. This requires some sacrifices of both personal autonomy and of group sovereignty, but really provides basically more support for personal growth and for group growth than would be possible by giving the weight to one's individuality as the central value or to group welfare as the central value. This is the basic gist of the notion of a democratic solution with a stress on the interdependence of the rights of the individual and of the group.

The foregoing is a brief analysis of healthy and unhealthy patterns

of resolution of the stress between personal independence inclinations and group conformity expectations. We have been making the assumption that the child experiences in the classroom a reality of one or more strong group loyalties, rather than merely a dyadic relationship between a teacher and a child. Let us stop and challenge that by considering the third major question.

3. *How "Real" Is the Classroom as a Group?*

There are clear data beginning with the kindergarten, about the rapidity with which a peer social structure of rather stable interpersonal evaluations between children develops in the classroom. For example, measures of interpersonal status were made in kindergarten through sixth grade in September and in May. The questions included a measure of, "Who is able to get me to do what he wants me to do?" and, "Who is not able to influence me?" (a power status measure). Another measure was made of positive and negative acceptance (emotional status measure). A third measure was "Who is good at doing the things that we do in this classroom?" (expert status). The correlations from September to May averaged above .70 for kindergarten, first and second grade, and above .80 for upper elementary. The child clearly creates a stable social structure of status positions. Not only that, but the children have a high consensus about who is at the top and who is at the bottom of the totem pole. There is also considerable haloing of high and low positions on different dimensions of evaluation. If we see him as high status on one quality, then we say he is high on the others also. This is not necessarily objectively valid in terms of the resourcefulness of the individuals, but it does exist as a barrier to flexibility of opportunity for recognition and leadership in the group.

There are group variations from classroom to classroom, from age to age, and also from social class to social class as to the basis of evaluation of expertness or of high power. For example, there are changes in the amount of weight given to physical resourcefulness as an element in social power. It changes greatly from class to class and age to age. There is a difference in weight given to intellectual resourcefulness as a major determinant of what is seen as expertness in the classroom. There are also variations in how painful it is to be at the bottom of a classroom group. Some children who are at the bottom of the classroom social structure still may have as much as 15 or 20 percent success in their influence attempts with other children. In other classrooms they may have only two or three percent success. There is also a difference in the high power members as to the extent to which they will distribute social control. In some classes those at the top may show an 80 percent rejection of influence attempts addressed to them. Other child leaders may show only a 30 or 40 percent rejection. So there are great differences in the meaning and

the behavior patterns of top and bottom. The top and bottom always exist and exist very firmly and consistently. On the whole, teachers seem eager not to know about it. Somehow it seems threatening that children are looking to each other for influence rather than just to the teacher.

What are some of the meanings of this peer social structure in the classroom? Van Egmond has just finished study[1] on the extent to which position in this social structure affects learning. He used a simple measure of utilization of one's intellectual resources, the extent to which one's achievement is highly discrepant with IQ. He coded children in terms of *over* or *under* or *balanced* level utilization of intelligence; *under* being those who have an achievement much below their IQ; *over* being those with achievement well above IQ. Then he matched children for IQ who were in the bottom and top quartiles of the class in *social acceptance* by their peers, or who were in the bottom and the top of their class in *social influence* on their peers. He found that those who are in the lower quartile of the class social structure are under-utilizers of their intellectual resources as compared to those who are in the top quartile of the social structure, with IQ held constant. He had an additional hypothesis that girls would have their achievement more disrupted by being disliked than boys would, and that boys would be more disrupted by having low power status than girls would.

In another project we have been studying delinquent boys and matched nondelinquents. These are boys who have serious records of delinquency matched with other boys who have the same IQ, same father's occupation, but who have never had any trouble. One of the most meaningful differences is that the delinquents much more frequently have a record of early failure experience in elementary school, and of having become alienated from the adult socialization culture through failure in the classroom group in relation to the teacher. Also, there is suggestive evidence that children who had been having such failure experience in school show an increase of stress at home in their relationships to parents because of the failure experience in school. Achievement and social relations appear to influence each other substantially.

4. *Healthy Classroom Conditions*[2]

Let us turn to the fourth question. Here is a classroom made up of individuals with various degrees of development of their individual identity, and who have coped in various ways with the problem of belonging. They may have adopted the defense of withdrawal from

[1] Elmer Van Egmond. *Social Interrelationship Skills and Effective Utilization of Intelligence in the Classroom.* Unpublished doctoral dissertation. Ann Arbor: The University of Michigan, 1960.

[2] Paper by Leland Bradford, "The Class Group and Individual Learning," National Training Laboratories, NEA, 1960.

belongingness in a classroom group, or they may have adopted the high dependency solution. At one and the same time, they are coping with the problem of multiple loyalty to a teacher-led group structure, to a peer-led group structure, and to family membership. What are some of the important classroom conditions that seem to be basic in promoting a healthy pattern of individualization of learning and of functioning within a strong, organized classroom group? There has been little research on the forces emanating from the group supporting individuality. Basically, three conditions of group life must be accomplished in a classroom through the initiative of teacher leadership in order to achieve the balanced objective we are talking about.

The classroom group, including the teacher, must arrive by some processes at an articulate understanding and acceptance of the idea that one of the essential group goals is to facilitate the learning of all members. This is a productivity objective of the group. A second condition is that the classroom group must arrive at a re-evaluated understanding of the fact of individual differences (in the resources, the backgrounds, the interests, levels of development, the sex differences, the needs for help) of the members of that group so that loyalty to the group learning goal can lead to appropriate support and help of different individual patterns of learning. If one asks children, "Who is different in this group or classroom?" 90 percent of the responses will indicate a negative meaning of difference. But when one asks teachers, one gets comparable results. The third condition is that the teacher must achieve genuine membership in the classroom group, a membership which means there is a distribution of function and of responsibility for helping with learning. Another aspect of that condition is a free flow of feedback from the child members to the teacher about her playing of her specialized role and guidance by them of her in playing that role.

What are some of the consequences that would derive from these three orientations of a teacher? First, these orientations would make it possible for a teacher to share with the rest of the classroom group this question: What is there about our class that is keeping some of us from learning more, and what can we do to improve the situation? This must become a question which the group works on.

Second, the competitive and anxious feelings about position in the group on the part of children, competence anxiety by boys, acceptance and inclusion anxiety by girls, would begin to be replaced by active caring by and for members of the group. Also there would be freedom to seek help from the teacher and from fellow students without fear of violating group norms or of losing position in a status structure. A third consequence would be that students could begin to explore and to appreciate with psychological safety some of the facts of differences

among themselves. For example, some of our teachers work with what they call the surprise package. The activity is one in which children are paired by random numbers and the two then interview each other. They discover some things they can tell the others about, such as the surprise package aspects of the person they have just talked to. Some classrooms have interesting surprise package notebooks they keep, adding things they discover about individual differences in backgrounds and experiences of the members of the group. Classroom groups can begin to explore the meaning of sex differences in terms of the different kinds of resources, of the meanings for boys of the fact of earlier maturity, of verbal facility for girls, of the achievement reward boys get for initiation of action, and some of the meanings of differences in outside membership sources of the different members of the group. A fourth condition that would flow from the three basic orientations, would be that teacher time and energy would become devoted more actively to the organization of challenging learning opportunities rather than to the issues of motivation and control. Fifth, the teacher could devote time to the development and the utilization of student manpower resources for helping each other. In one of our experiments we had training courses for the high powered youngsters on how to recognize the needs for inclusion, feelings of being left out, and kinds of initiative that can be taken as responsible membership by those who have power. We found tremendous eagerness for responsibility-taking of these unused, unchallenged resources.

What are some of the implications for teacher orientations and practices of some of these? This is the fifth question.

5. *Teacher Practices*

What kinds of conditions seem to be necessary if a group is really to support and encourage individuality? First of all, there would be a basic shift on the part of the teacher from primarily a teacher-pupil pair orientation to a teacher-group relationship in which the responsibility and concern of the peer group is just as much for effective teacher-group relationship as it is for pupil-pupil relationship. Another of the implications is that there should be a great increase in the teacher's skills in training children for membership and leadership roles in the group. Only when this is done can the class group really produce more individual learning. This is primarily a class productivity problem, the producing of individuality of learning experiences. Third, one of the challenges for teachers is the development of skills in procedural inventions to facilitate individualization of learning. This is the area of division of labor, the development of helping teams, of tutorial pairs, the use of resource persons, and the development of materials. Many places are rethinking the age-graded organization of school life. Many of the best learning op-

portunities are those in which older children could be getting much of their growth and excitement out of helping younger children to learn, as well as helping those of different developmental levels within the same group. A fourth kind of teacher practice is the development by teachers of feedback skills that give supported guidance to children rather than destructive failure experiences. This has been worked on a great deal in education—how to give feedback about level of accomplishment, or level of success. The major problem is that this has been primarily a teacher-pupil pair relationship which is continuously offset by the peer culture. And fifth, teachers can become aware of the differences between the processes by which cognitive content information is transmitted and learned and the process by which values are taught and learned. To a high degree we are still teaching *about* values, like respect for individual differences, rather than making the learning of these values possible.

6. *Key Issues of Approach to Research*

What about implications for developmental research? Certain approaches to research seem to be challenging. For example, the possibility of collaboration in research by high school student teams is a promising development. We had in our preparation for the White House Conference in Michigan 15,000 lay citizens involved in collecting data. There was a teen-age coordinator of research as well as an adult coordinator. The teen-agers were involved in collecting data from peer questionnaires. There was great enthusiasm and a high level of responsibility, although we did a very inadequate job of training youth for participation compared with what we should have done. Students could do a great deal to explore to what extent there is pluralistic ignorance about students' taking schoolwork more seriously. With training and supervision, students could do a much better job of collecting some of the data on the way in which children experience inconsistency between expectations of the school and the home. We have had quite a bit of experience now with training junior high and senior high students in skills such as using interviewing schedules. They can do a mature job. It is a great challenge to students to learn and to use scientific methods.

Another direction is that of creating operational research committees among the faculty members. An operational research committee has to have several kinds of support. Such a committee has to have some initial consultation on formulating designs, and in the development of data collecting instruments. At a later stage, the committee needs to have available a research assistant to help in the processing of data. Several high school students could be good research assistants in many cases. Doing research within a classroom would have both instructional value and research value. I know of two or three situations in which classrooms

have a rotating responsibility for feedback teams, which review the questionnaire that is used at the end of each class period. Data are collected on the extent to which the students felt restraint against participation, or had feelings of unclarity about communication that was going on. Here we tend to use the word *inquiry* rather than *research* because research sometimes gets to be a rather threatening image.

There are two or three situations in which school systems have become continuing research facilities for a university-based team. This pattern is relatively slow in developing in education, as compared with industry. Quite a number of industries now have a continuing relationship with a university team.

We are collaborating with a significant community committee in which the continuing program is on socialization of youth with particular emphasis on outstanding youths and delinquents. These are notions of research patterns which can be applied to the research topics and issues that are important to you. We have a great challenge in the area of collaborative research to utilize the skills possessed by the large proportion of mature members of the child and youth culture.

A Tentative Description of the Creative Individual[1]

CALVIN W. TAYLOR

Recently a researcher in education wrote that "If anything is needed in our educational system, it is a way to speed up the application of research findings to educational procedures." We all have some responsibility in this area. Some of us who have been doing basic research must communicate our findings and our suggested new leads while those in education, in my opinion, have a responsibility for testing out these findings in their setting and incorporating into their system those that prove to be relevant and effective.[2] At best I feel only partly adequate in my attempt to transmit some of the many ideas and findings that have emerged from research on creativity to date.

In treating the topic of creativity, I would rather err by exaggerating differences and unsolved problems and by stirring thought and counteractions than by debunking these problems and differences. My approach will be more to stir research and thinking than to attempt prematurely to find a perfect stance and to make perfect statements in this relatively young scientific field.

[1] This paper is a revised version of a report given at the Second Minnesota Conference on Gifted Children held at the University of Minnesota in October 1959.

[2] In Utah, we are engaged in a research project with support from the U. S. Office of Education in which we are searching for and assembling relevant research findings from psychology and other fields that have implications for education.

Several Types of Gifted

In order to stir such thinking I have recently been stating to others that they may want to seek the gifted, but I am interested in seeking the creative. Then I indicate that the word "gifted" as typically used is closely tied to the current intelligence tests, but that I will be using quite different tests in a search for the creative. The word gifted has also been tied to high academic performance in school-like activities, not often very creative in nature. The implication is that there may be essentially two different worlds, the academic world with its current school-like activities, and an almost different world on the job calling for creative activities as well as other activities which may not involve very much the nature of the activities in school.

Actually the reader may already be using this recently adopted approach, and may be expanding his concept of gifted to include creativity. This expanding of the meaning of the word "gifted," usually emerges quite rapidly, as a counteraction to an attempt to make a sharp distinction between the gifted and the creative. However, some points should be made by contrasting intelligence, as measured by the traditional type of IQ tests, with creative talent. The traditional intelligence tests cover only a *very few* of the *large number of dimensions of the mind* that we have been discovering to date. Consequently, there may be several other types of intellectually gifted than the IQ type, even though the IQ type may be closely tied to our current academic activities and to the grades that measure success in our present academic world.

I will focus on the creative type of gifted rather than on the IQ type. My current thought is that there may be not only several different types of creativity, but also *several other types of gifted*, relatively separate from the IQ type and the creative types. Some of these other types may be planning, evaluation or decision making, and communication types. Before focusing on creative types of gifted, let us comment on the total field of high level talent.

Certain Concepts May Deter Future Progress

A friend once said that we would make further progress in a particular area when we became sufficiently dissatisfied with the shortcomings of the current categories in that area, even though the categories had served valuable purposes up to that time. In considering giftedness, we may now need to recognize the difficulties in many of the current categories and concepts that have quite wide usage in order to make better progress. For example, with the discovery of 50 or more dimensions of the mind, only a handful of which are currently included in our IQ

tests, we find it difficult to refer to these other 40 or so dimensions in customary terms. They are *not* a part of intelligence (as traditionally measured) though they are *intellectual* activities. Consequently, we could describe these many other important dimensions of the mind as *non-intelligence intellectual activities.* Undoubtedly you will admit that this is a clumsy and confusing type of statement. This statement illustrates our difficult predicament in trying to communicate many new research findings on the complexity of the mind.

Another example of the limitations of current terminology is that we now might say that a certain person does not particularly have high intelligence even though he does have a certain *special ability,* such as merely the special ability to do scientific research, or the special ability to be creative in one or more fields such as composing new music, or the special ability to pioneer new ventures, or the special ability to emerge as a leading executive in our world of work. The reader can readily see that I am not particularly fond of the current, almost completely pre-eminent position of the initial set of dimensions of the mind which have formed our concept of intelligence.

I do not like to see *other really parallel things* actually relegated to an implied lesser category called "special abilities." Instead, I have often felt that the human characteristics that we are able to measure *first* are *not necessarily the most important* characteristics. Some of the remaining characteristics which have been postponed for later measurement may often be extremely important characteristics. We have just not known how to measure them earlier.

It is highly inconsistent to conceive of the mind as being represented by a single score or even by only a handful of scores or dimensions that are present in our current intelligence tests. The brain which underlies the mind is far, far too complex to hope that all of its intellectual activities can be represented by only a single score or by only a handful of dimensions. In fact, it might be considered an insult to the brain and human mind to continue to do so. Consequently, I would like to see these other dimensions *receive parallel treatment* to the first set of dimensions that we have combined (in many different combinations, incidentally) to form our current intelligence tests.

For a long time I have similarly been troubled about the readiness with which some persons conclude that everything in an activity that is not measured by our current intelligence tests is *therefore nonintellectual* in nature. Too many new and potentially important intellectual factors have now emerged for this type of reasoning to be tolerated any longer.

Another concept that I would like to mention is the one of *over-achievement-underachievement.* This concept is frequently tied to our current intelligence testing and it undoubtedly has some real merits. But

when carried to an extreme it suggests that something is wrong with a student when he is located some distance either below or above his predicted score and that some appropriate corrective steps should be taken. In an extreme form, this thinking and action suggest an underlying belief, even a deep conviction, that the particular test score should truly be an almost perfect predictor of success. The action often taken has the implication that this score contains *all* the necessary ingredients within it. This approach would lead to the ultimate revision of both our academic and counseling program to make the nature of school and of success in school more highly parallel to the activities measured in our intelligence tests. I, for one, do *not believe* that changes in the nature of school programs should follow this guideline.

Let us alternately consider a group called the academically gifted. It is quite true that some of our most successful predictions have been made by predicting success in college from measures of success in high school. Such predictions usually apply quite well across several years of college work. To me it seems possible that these predictions may work too well and too long. In other words, one possible conclusion from such relationships is that college work is very much like high school work and perhaps resembles high school *far too much.* My preference would be to try to make high school more like graduate school rather than vice versa.

In this regard a recent study by Guilford and Allen seems relevant. They selected some 28 dimensions of the mind which they felt were relevant to success on the job in the physical sciences. Then they prepared plain English descriptions and also a sample item of a best test for each of these 28 intellectual characteristics. A sizable number of scientists on the job were interviewed by Allen, after which he asked them to arrange these 28 characteristics in terms of importance on their job. The 28 characteristics were arranged in rank order according to their judged importance by the total group of scientists. Traditional intelligence tests have included about 5 or 6 of these characteristics, such as general reasoning, vocabulary ability, number ability, memory for ideas, ability to visualize spatially, and perhaps perceptual speed. All but one of these traditional intelligence factors ranked below 20th in the list. In other words, 19 of the 20 intellectual characteristics ranking at the top on the job in science were *nonintelligence intellectual characteristics.* Some examples are intellectual flexibilities, fluencies, originality, penetration, redefinition ability, sensitivity to problems, etc.

This finding suggests that the nature of our educational program, at least in science, as well as the nature of our measures of success in school should move in the direction of more emphasis on these abilities. Incidentally, as one moves further through school one finds that the predictive value, especially of the vocabulary part of intelligence tests tends to

decrease. Some will say, "Well, that is because of the criterion problem, the measure-of-success problem." You will find, however, that the nature of the task is changing to some degree away from the characteristics in intelligence tests, as you get into graduate school and particularly as you get on the job. This trend also suggests that we should be seriously concerned with searching for other kinds of high level talent, other kinds of gifted, in addition to the current academically gifted or the current IQ type of gifted.

There have been two studies in the field of science on relatively large samples which have shown that the total undergraduate grade point average in college correlated zero with over-all ratings of success on the job in large research organizations in our nation. In one of these studies some people were placed on the job even though their total grade point average had been less than "C" (they had been granted a degree with this average). Those with low grades had succeeded on the job with some being found at each rated level of success. The top grade-getters likewise spread out across all levels of success on the job. Although there are other studies with smaller samples that have yielded somewhat more positive findings along this line, it is suggested that we seriously consider some modifications in our academic program in view of these results. Then other dimensions of the mind which are important in certain work on the job will *no longer be largely ignored* in our school-like activities in which presumably we are trying to develop the mind. At least this would be one new approach in education.

We have finished a first large project on our campus on a study of human communication abilities as *required frequently on the job* in large organizations. Though these communication abilities tests might be classified by some persons as nonintellectual in nature, we feel that practically all of them have a high degree of intellectual features. For example, the ability to sense that something is wrong with a communication, then to raise effective questions about what is wrong, and to get answers to the questions are all activities that could be called intellectual in nature.

Our sample of college students found these communication activities to be very challenging and highly interesting. They stated that they had rarely been asked before to do anything like the nature of most of these activities. In fact they called them parlor games. We think that their main motivation for returning on three successive Saturdays (in spring weather) was to find out about the nature of the remaining tests. From this testing experience we again conclude that there are many important intellectual activities in the world of work for which our current students are not receiving any particular training or experience. Perhaps one reason why our society does not give very much moral and tangible support to education is that persons leave the academic world and find, to some de-

gree at least, that characteristics in which they are highly trained are not called for as much as they expected they would be in the world of work. Contrarily, other intellectual characteristics in which they have had little experience and training may be some of the more crucial characteristics that determine success in their part of the world of work.

In our tightening manpower predicament it will be advantageous to find that there are several different types of high level talent and that a somewhat different set of persons emerge in successive groups as we seek different types of high level talent. This prospect is very heartening. We are properly concerned about the percentage loss of high IQ students across the various levels of our total educational system. We should similarly be concerned about the loss of other types of high level talent. We have strong reason to believe that the loss of those with high creative ability is greater than the loss of the highly intelligent and may even exceed the drop-out rate for students in general.

It may be that more rapid progress will be obtained in a complex area, such as communication abilities or creative abilities, by admitting early that the area is highly complex and by taking a stand that things are really different until demonstrated otherwise. If the initial package is highly complex, then researchers, as well as users and the public at large, might be more enthusiastic in seeking simpler approaches than those initially offered. The other extreme approach is to give an initial impression to the consumers and public that an area is much simpler than it actually is, as has been done in the case of representing intelligence by a single score. In this latter approach (in contrast to the former one) there might be *considerable reluctance and resistance* to move toward the middle ground of moderate complexity from this initial ground of extreme simplicity. My best guess is that we will have more support to *make rapid progress* by initially viewing the field of creativity as highly complex than by starting at the other oversimplified extreme.

Creative Talent Not Measured Well by IQ Tests

For those who have the idea that IQ tests measure creative talent with at least some degree of validity, I would like to cite a few results. In factor analysis studies by research workers across the country, the factors which get at the ability to sense problem areas, to be flexible, and to produce new and original ideas tend to be *unrelated* or to have only low relations with the types of tests entering into our current measures of intelligence. Getzels and Jackson, in the College of Education at the University of Chicago, as well as Torrance, in the Bureau of Educational Research at Minnesota, have reported that if an IQ test is used to select top level talent, about 70 percent of the persons who have the highest 20

percent of the scores on a creativity test battery will be missed. Or, stated otherwise, more cases with high creativity scores are missed than are identified by using an IQ test to locate creative talent.

In our Utah conference reports on creativity there have been several indications that creativity scores and IQ scores are essentially unrelated or at least are only lowly related. The nature of traditional intelligence tests does not directly involve the ability to create new ideas or things. Another bit of evidence on this point is that Chorness studied civilian personnel in the Air Force who made suggestions in the organization which were officially accepted. He obtained approximate IQ scores on them and found that these suggestors of good ideas were spread out across the entire gamut of IQ scores found for civilian personnel.

Let us be flexible and toy for a moment with our present situation. If a creativity index had been established first in our schools, we might now be putting forth the same type of arguments to make room to add an intelligence type of index if it had been largely ignored to date. Lest the reader misunderstand my message, let me state that my viewpoint is definitely for measurement of human beings as well as for research on people.

My attempt will be to open wide the problems in identifying creative talent in science and in other fields rather than to give any strong impression of closing up and wrapping up this field at the present time. This may be a time more appropriate for *divergent* (expanding, elaborating) thinking, with a variety of attempts, than for *convergent* (reducing, abstracting, shrinking, extracting) thinking with firm crystallization. Some convergent thinking, some reduction attempts, can and should be occurring, but any crystallization should certainly be considered as tentative at the present time in this field. The ability to uncrystallize as further research findings emerge is an important counterpart for any crystallization process. As we consider creativity in individuals, we must never forget that an unexpected idea that emerges from a student may be as good and occasionally better than the more commonplace idea that we expected from him.

I am pleased that there is a growing awareness in the nation of the importance of the topic of creativity. I am deeply concerned about trying to *speed up the rate of this growing awareness*. As a result of correspondence with persons from Belgium, Holland, France, Switzerland, and Sweden, I am also cognizant of the similar progress being made in European countries on this topic. You may be interested to know that the National Academy of Sciences in Poland is initiating a large study in the universities of the creative talent of their students, especially in science. In some respects our nation has had a lead in this vital research on creativity, but challenges may arise to close the gap on that lead, too.

Early Identification, Development, and Encouragement of Creativity

Our nation is currently spending several billion dollars on research and development activities. With such a vast expenditure of money it seems obvious that at least a minute percentage of it should be channeled into research on how to identify, develop and encourage those who will be most fruitful in science if their research is supported. I doubt if more than 2/1000th of one percent of the nation's research and development budget is currently being spent this way.

I am also aware that many of our present organizations and systems, including the key people in them, are not necessarily encouraging creativity. For example, in a study in our 1959 conference report by Frank Jex of the College of Education, University of Utah, a group of high school science teachers in our region were tested with an "ingenuity" battery (which probably measures creativity more than ingenuity) when they came to our university for graduate study. Their ingenuity scores were correlated with their principals' or supervisors' ratings of their over-all teaching ability made during the previous year. The correlation was –.38. This result from one study suggests that the present academic system may be looking with some disfavor upon teachers who show certain ingenuity and creativity characteristics. It may be possible that these teachers are developing ingenuity traits in their students more than other teachers are doing.

We all recognize that it would be to our advantage if we could identify creative talent very early in life. However, the creative process in its greatest degree is one of the highest, if not the highest, activity to which man can aspire and is currently a relatively rare phenomenon. Consequently, the prediction problem is difficult if we try to identify in the very early ages those persons who, 15 or 30 years later, might be the ones most likely to have a rare, high level creative process occur within them. The difficulty of these early prediction attempts can be further realized from the fact that society has often failed to recognize creative products until a generation or two after the persons who created them have lived. Even when creative persons are recognized, organizations in our nation may reward them by making them supervisors and by also increasing the number of essentially noncreative activities for which they are responsible. Many of our present academic programs are stressing noncreative activities so that the work habits which are being developed are strongly ingrained and are valuable in accomplishing noncreative things. Some of these successful persons may show real resistance and perhaps emotional disturbance if relatively late in their education, or any time afterwards on the job, they are asked to be crea-

tive. They may resist this late change "in the nature of the ball game" even though they may have high, though uncultivated potential to be creative. Such conflicts might be avoided if creativity training and encouragement had occurred much earlier or even throughout their entire academic training.

On this issue we have heard from more than one source that there is another degree beyond the academic Ph.D. degree. This is called the *on-the-job* Ph.D. degree. We are told that three or four additional years are required for this degree, partly because this amount of time is needed to wear off certain bad effects in the academic doctorate and also to develop new abilities required on the job. These emerging comments increase one's suspicions that there are not only important variables missing in our searches for talent but also many important high level abilities being largely ignored in the education and development of our children and youth.

Scientific knowledge about creative talent is in an early stage, but some real progress has been made—the surface has unquestionably been scratched. We are currently at a stage where it can *no longer be said* that research cannot be done on creative talent. In fact, there are currently too many leads to follow rather than too few leads. There have been a small number of studies to validate certain creativity tests (predictors of creativity) and a few criterion studies to measure the degree of creativeness in a contribution. Many other available tests have not yet been validated to any degree and many new ideas have been proposed for which tests have not yet been developed. Cross-validation studies are largely missing to date as are parallel studies of creativity across different fields of science and across nonscientific fields, except for recent work by Lowenfeld. There are a few beginnings on how different educational and training programs as well as different working environments might modify our predictions of creativity. Anything that can be done to modify our educational programs and our environmental conditions to increase the emergence of creative activity will reduce the burden of identifying the creative individual. This last point cannot be overstressed.

Findings in the Three Utah Research Conferences on Creativity

The following report is based largely on our own research and on research reported in the three University of Utah research conferences on the Identification of Creative Scientific Talent. In each of these research conferences held in 1955, 1957, and 1959, the steering committee selected those participants throughout the nation who had done signifi-

cant research and who the committee felt would make the best contribution to the conference topic. In total, there were 37 different nationally selected participants in the three conferences who presented a total of nearly 50 reports. These research papers covered various subareas of creativity, such as criteria of creativity, predictors of creativity, education and training of creativity, and working environments that affect creativity.

The emphasis has been on a broad approach to the identification of creative talent, somewhat in contrast to the identification of the so-called gifted *by means of a single measuring device* such as an IQ score. *Nonintelligence intellectual* characteristics as well as *nonintellectual* characteristics are being stressed in the search for the creative individual. In other words this treatment will include intellectual, motivational, biographical, sociometric, and personality characteristics in trying to understand the nature of creative talent and how to identify it. We (in our study of Air Force scientists) and other researchers have been attempting to measure creative talent from any angle possible.

More studies on creative characteristics have been done on adults than on children. There are now many challenging tasks of redesigning the measuring devices for adults, where necessary, so that they can be used with children of all ages. As a result of his experiences in training children in creative activities, Wilson of the Portland, Oregon, studies, said that children would be eager to go to school if they found it all to be as interesting as their experience in these creative activities. Torrance also recently wrote that when he went in to a group of 4th graders recently to test them further with creativity tests, "He received a thunderous welcome. Not even the coming of recess time dampened their motivation. Instead they said that this is more fun than recess!" We had somewhat similar favorable reactions from the young adults who took our communication abilities tests.

Teachers who have tried to help students learn to generate and express ideas of their own have often found new inspiration and new concepts for themselves, too, in the process.

Criterion Studies of Creativity

First, I would like to cite studies of creativity on the job. Sprecher was interested in the novelty and the value of the ideas and other products produced by scientists as well as their work habits. He also was concerned about differences in opportunity to be creative in their working situation. Lacklen has indicated that the Space Agency attempts to assess the creativeness of the contribution of scientists by determining *the extent of the area of science which each contribution underlies,* so that the more basic a contribution the wider its effects. Ghiselin of our

campus has suggested that the measure of a creative product should be "*the extent to which it restructures our universe of understanding.*"

In our criterion studies of scientists on their jobs,[a] products as well as processes of people have been judged and over-all ratings of creativity have been obtained using various types of measuring devices. We analyzed about 50 measures of different contributions of scientists. We found 15 different dimensions of the contributions of scientists, at least five of which involve some aspect that could be called creative. These five were: over-all work output which included patent rate; creativity rating by supervisors; creativity rating by lab monitor; originality in written products including patents and suggestions; and organizational awards (which were slightly negatively related to originality ratings of research reports).

Group Aspects of Creativity

We discovered some unexpected but intriguing and meaningful results in our criterion study pertaining to working conditions for researchers in scientific laboratories. The number of published scientific *articles* was negatively related to rating by supervisors on cooperation and flexibility. In other words, those who go the "extra mile" and publish their completed research may pay a price of being judged uncooperative and inflexible by their supervisor. The second finding is the one which is more directly concerned with creativity than with productivity. Those who have the fastest promotion rate have been credited with very few official suggestions and rate themselves below the average rating in their desire for discovery. Stated otherwise, for this one situation studied, those with a strong desire for discovery, who also make good official suggestions to the organization, have a *below average* rate of promotion.

In seeking the creative, one may find some important leads by looking somewhat away from instead of directly toward the target. Clues for spotting creative talent may be obtained by watching the reactions of others around a person. There is some support for this hunch from the work at Minnesota. If some persons in a group appear excited, disturbed or threatened, *perhaps* there is a creative person around whose ideas and work are being at least vaguely sensed as threatening the present scheme of things. Some group behaviors may occur as an attempt to eliminate or reduce this threat, such as by developing *sanctions against* the person and by over-organizing and building other controls into their world. An experimental approach may be tried here by removing one person at a time from the group to see in which case the group tensions

[a] This project is being accomplished on Contract AF 41(657)-158 with the Personnel Laboratory, WADC, of the Air Force.

are reduced the most. Unfortunately (and this is true with other selection devices) one may locate other types in addition to some creative individuals by this procedure.

In group discussion sessions (including brainstorming sessions), individuals differ widely in their contributions to the flow of ideas. Some persons help to set the stage while others make crucial leaps ahead in the discussion. Some persons do *not* slavishly follow the flow of the discussion. Instead, they think "at right angles" on an unusual train of thought. Later they may speak up to send the discussion down new and fresh avenues. One person did this several times recently during a tape-recorded session, whereas the contribution of others seemed to be merely minor variations or refinements around already existing themes. In creativity training sessions, one similarly might build measuring devices to identify those with the greatest readiness initially for such training as well as those who show the greatest gains during the training.

Bloom has indicated that science students who truly become involved in research work and in the research role during graduate training, tend to become the productive researchers afterwards. Contrarily, those who do *not* get really involved in research as they finish their advanced degree requirements but somehow get by this hurdle without becoming involved, usually manage *not* to produce research afterwards and also usually manage to avoid research opportunities. If the creative are to be found somewhere among the productive, then in science we can reduce our problem by finding those students who truly become involved in research problems during their academic career. Some analogous situations entailing student involvement could also be sought in non-scientific fields. We might seek out such persons at almost any academic level if we set up the situation properly and ask for the right type of performances.

Some Intellectual Characteristics

The results from Torrance's descriptions from one's fellow students seem promising. Consequently, well designed confidential reports including ratings, check lists, and written descriptions from peers and from appropriately selected teachers and supervisors (as well as ratings on oneself) should not be overlooked as possibilities for identifying those with above average promise of being creative. One basic question here is to what degree a rater must have creative characteristics himself in order to be able to judge whether another individual has a high degree of these characteristics.

Based upon insights derived from factorial findings of many workers, Guilford has evolved and listed the following specific factors or intelle-

tual characteristics as most likely to be valid measures of creative talent: originality, redefinition, adaptive flexibility, spontaneous flexibility, associational fluency, expressional fluency, word fluency, ideational fluency, elaboration, and probably some evaluation factors.

Speaking more broadly, some components of memory, cognition, evaluation, and more particularly convergent production and especially divergent production are involved in creative work. The divergent production area is possibly the one which has been most overlooked to date in our efforts in psychological measurement. It is probably the most important area in creative talent, since it includes production of ideas in quantity and in quality, originality, flexibility, sensitivities, and redefinition abilities. Pictorial fluency may be an example of a characteristic needed more in creative work in art than in science.

Convergent (reduction) thinking undoubtedly also has a role in creative work. Our communication research would suggest that the ability to converge and recognize a correct answer on a multiple choice task is probably not sufficiently similar to be used as a substitute for an open ended task of extracting a fresh generalization from a mass of data or otherwise expressing one's own product as a result of convergent thinking. While we can accomplish many fine things by using separate answer sheets and multiple choice questions, let us not conclude that we can measure everything by using them.

Mainly as a result of Guilford and Wilson's particular factor study on creativity, certain batteries of tests usually including mainly divergent thinking tasks are being used in some industrial and educational settings to identify creative talent. Persons selected by this type of creative battery have shown a higher degree of certain intellectual characteristics, such as more fantasies and more ability and tendency to toy with ideas, than found in comparison groups selected on the basis of high IQ scores. They also tend to be more able to suggest solutions when problems arise with gadgets, than to merely "curse the gadgets." The research leaders in the educational setting are Getzels and Jackson, and Torrance.

Ability to sense problems is another intellectual characteristic that is usually included in creativity. It may also lead to motivational features. The capacity to be puzzled may be a very important characteristic. A keen observer once said that part of Einstein's genius was his inability to understand the obvious. Thus the rejection of superficial explanations of one's own as well as of others is a prerequisite to understanding and *to know when you don't know* may be a crucial ability needed in making original contributions.

From our communication abilities research we feel that the ability to sense ambiguities, plus effective questioning ability, may be important in creative activity. This may alternately be described as curiosity in

action. Thus, I sense that many of the components of curiosity and of motivation are of an intellectual nature.

Our revision test, even though it involves only verbal revision, is at least analogous to the manipulation, restructuring and reworking of ideas found both in the earlier and later stages of the creative process. It is probably also related to the ability and tendency to strive for more comprehensive answers or solutions or products, another feature that has emerged in on-the-job studies of creativity. Unfortunately, we find too few occasions in our academic programs requiring such revisions and strivings for a higher quality or for more original and workable products. Likewise, most of the other creative characteristics are often ignored or not particularly stressed in present academic programs.

Somewhat in contrast with this reworking and thoroughness characteristic, we found a verbal superficiality factor. At least in science and perhaps in certain other fields, it seems unlikely that either creative or profound contributions will come from dilettantes.

At least two response-set factors, which we have found, may measure characteristics functioning in creativity. The first one is called "*broadly diffused attention.*" This type of attention has often been a part of the description of the crucial moments preceding the insight stage of the creative process. The second response-set factor is described as a "resistance to idea reduction." The opposite end of this trait of willingness to reduce ideas may be valuable in creating broad new generalizations. In contrast are the persons who make second-order corrections on such generalizations; they may be resisting what they sense as an overreduction in ideas represented by the broad initial generalization. Both types of contributions have some value.

Creative persons in several fields usually state that they work intermittently across long periods of time (though perhaps almost continually below the conscious level) on their key problems. Consequently, Ghiselin has suggested that we try take-home aptitude tests to find those who continue to be involved and who jot down additional responses whenever and wherever they occur. Similarly, the ebb and flow of ideas in the creative process suggest the need for tests which show variability of performance within an individual across time. Presumably the person sought often functions at low level, but occasionally functions at a very high level. Maybe the person with the greatest variability across time has more creative potential.

Other tests or test ideas that may have validity include the abilities to form and test hunches (hypotheses), to foresee consequences, to infer causes, to evaluate revisions in a product, and to be able to toss one's ideas into the arena of ideas. Our finding of a verbal originality factor leads us to hope for an analogous measure of *nonverbal originality*. An-

other hunch, expressed in the Utah conferences, is that one needs to be able to manipulate several ideas concurrently in one's mind. We lack a good test which will determine the idea capacity of an individual. An interesting side question is whether we can increase such idea power by forming and training teams of workers.

Thurstone suggested that a creator has good rapport with his prefocal thoughts. We also need measures in the areas of imageless thought, preverbal thought, preconscious thought, and in the relations between thinking and the formulations of expressions for this thought. The ability to make good intuitive decisions on the basis of incomplete information may be relevant. Barron has suggested that we need to test the ability to express the heretofore unexpressed experience or phenomenon. He feels that creatives are more observant (seeing both what others do and what they do not do), that they place high value on truthful reporting and testifying of their observations, and that they have the ability to make them explicit. They also make richer syntheses and note their own impulses more. We might add here the possible importance not only of an *ability* to sense but also of the ability to question the implicit. We suspect there are some important unmeasured characteristics in the ability to pioneer in an unexplored area.

To summarize my current understanding of the intellectual aspects of creativity, I believe that there are many relatively separate intellectual components. It is therefore quite possible that multiple types of creative talent may exist. Another general hunch is that certain of these intellectual components may underlie some of the motivational forces in the creative person and may also be linked significantly to certain personality characteristics.

Motivational-Interest Characteristics

Many relevant characteristics have been suggested in this area. The great need is for good measuring instruments (for all ages) that will demonstrate the widespread belief of practically everyone that motivation is a strong component of creativity. Some motivational characteristics suggested are curiosity or inquiringness of mind, liking to think, liking to manipulate and toy with ideas, intellectual persistence, need for recognition for achievement, need for variety, need for autonomy, need for preference for complex order and for challenges therein, tolerance of ambiguity, resistance to closing up and crystallizing things prematurely coupled with a strong need for ultimate closure, need for mastery of a problem, insatiability for intellectual ordering, and a need to improve upon currently accepted orders and systems. High energy with vast work output through disciplined work habits is usually found.

Other traits suggested are a willingness to take greater and more long range risks for greater gain, and the tendency to accumulate an overabundance of raw stuff plus a willingness ultimately to discard some of it in forming final products. One provocative idea of D. McClelland's is that the creative person is willing to take a calculated risk larger (though not unrealistically large) than others and that his judgment of the odds in research areas is actually smaller than the average judgment from other persons. The creative individual presumably does not want to deal in a sheer gamble situation but rather to engage in a risk situation where his own efforts are involved so that they may make a difference in the odds.

Barron reports that the creatives have an intense esthetic and moral commitment to their work. They may also sense at least vaguely, a distinct sexual meaning to their act of creating.

Younger persons with creative talent, according to Getzels' findings, have a much greater variety of occupational choices, with greater interest in and awareness of unconventional careers, than do their fellow students. They sense that their views are not the predominant ones with reference to what success in adult life is. They are also willing to be nonconforming and consequently to be in the small minority.

Other Personality Characteristics

Some evidence to date on personality characteristics suggests that creative persons are more devoted to autonomy, more self sufficient, more independent in judgment (contrary to group agreement, if needed, to be an accurate judge), more open to the irrational in themselves, more stable, and more capable of taking greater risks in the hope for greater gains, more feminine in interests and characteristics (especially in awareness of one's impulses), more dominant and self assertive, more complex as a person, more self accepting, more resourceful and adventurous, more radical (Bohemian), more controlling of their own behavior by self concept, and possibly more emotionally sensitive, and more introverted but bold.

Other personal characteristics which may differ in relevance across different fields are: liking for ideas vs. people vs. things, socialization and interpersonal involvement tendencies, introversion-extroversion, surgency-desurgency, and impulse control (suppression vs. expression). In many fields there is often an incubation period, though differences may occur in the insight period.

For example, one view is that whenever a person has an inspiration in certain fields like art, he had better get to his canvas quickly before this feeling vanishes.

A research team at the University of Utah is currently studying samples of scientists locally, in the Air Force, and in the Space Agency with this biographical approach. Nearly every time that even a brief biographical inventory has been tried on scientists, it has been found to have promising validity in the initial sample studied. However, we are uncertain about the amount of loss in validity that will occur in second and third studies. We recognize that indirectly these items are getting at a hodgepodge of motivational and personality traits such as work habits, attitudes, interests, values, family and academic history, and several personality characteristics. As persons have various experiences through life and are exposed to different problems, ideas, training, treatments, environments, etc., they are "being *programmed*" in different ways so that the probability of their eventually being creative is changing either favorably or unfavorably. This program within each individual probably becomes less modifiable as time passes so it provides one basis for predicting future characteristics and performance. Many of our 600 biographical items being tried on scientists would be suitable for trial use with high school and possibly junior high school students.

Some Final Comments

As we look at this total challenging field, we believe, until shown otherwise, that quite different psychological processes are involved when we learn existing knowledge and systems than when we produce new ideas, new knowledge, and new systems. Education may teach people to recite the past and repeat past performances more often than to prepare them to develop new things or even to be ready for new developments by others. As a result, the perspectives of educated persons may be directed more to the past than forward. People are probably being far better prepared to perpetuate the past than to take new steps in the future that might improve upon the past. Certainly, one does not find a wide readiness for progress. Too often, strong fears rather than positive abilities emerge when the opportunity arises to take a new step forward, to pioneer at the frontiers. The sheer amount of education may not be a good basis for identifying those ready to take a new step.

We may need to identify and develop people who can learn the past without taking it too seriously (as some unfortunately do even to the point of almost worshipping it). We need people who can mentally toy with and manipulate man's knowledge and ideas and products of the past, who can use the past as a springboard for the future developments, and who can find new leads and do something with those leads to

improve upon the past. In other words, maybe our task is to produce more minds that are "tomorrow minds" than "yesterday minds."

I am repeatedly concerned with restrictions, inhibitions and deterrents within a person as contrasted with freedom within him. I am saddened when I find within myself or in others that some of these inhibitors are really self-imposed restrictions that reduce the possibility of generating new, fresh solutions in problem areas. These built-in restrictions can thus reduce the freedom and potentialities of a person and may even block his efforts that would otherwise lead to successful performance.

I am also concerned when I sense that many administrators, who presumably have a responsibility to facilitate helpful new developments, often seem to be much more interested in controls than in progress. On this point of organizational controls, the creative persons may be the ones who will most appreciate the necessity of a few very good rules in an organization. Contrarily, they may be most sensitive to unnecessary rules that are built in by people. The creative may be those who attempt to work their way out of such needless restrictions.

This report has been much more [illegible] upon thinking and research on creative talent in science (especially physical science) than in the arts and other fields (though creative writers have been studied). I have stated more than once before that science may have more to learn about creativity from the arts than vice versa. I am also aware that most of the research work to date has been done with adults instead of with children.

It will be much healthier when we can sharpen and reduce this long list of characteristics and also tie the appropriate ones to different types of creative talent. Nonetheless, it is good at this stage to have so many tangible and suggested leads to try.

Bibliography

1. Calvin W. Taylor, Editor. *The Identification of Creative Scientific Talent.* Essentially verbatim report of the 1955 University of Utah national research conference. Salt Lake City: University of Utah Press, 1956. 268 p.

2. Calvin W. Taylor, Editor. *The Identification of Creative Scientific Talent.* Essentially verbatim report of the 1957 University of Utah national research conference. Salt Lake City: University of Utah Press, 1958. 255 p.

3. Calvin W. Taylor, Editor. *The Identification of Creative Scientific Talent.* Essentially verbatim report of the 1959 University of Utah national research conference. Salt Lake City: University of Utah Press, 1959. 334 p.

4. Calvin W. Taylor, William R. Smith, Brewster Ghiselin, Boyd V. Sheets and John R. Cochran. *Communication Abilities in Military Situations.* Technical Report WADC—TR—58-92. Personnel Laboratory, Wright Air Development Center, 1958.

In Summary . . .

Human Variability and Learning: Recurring Themes and Research Suggestions

WALTER B. WAETJEN

Hardly a book, article or monograph written in the field of education or psychology fails to make some reference to human variability—individual differences. Indeed, it is a point of honor for us to affirm that curriculum content and instructional activities must be geared to the individual differences of learners. We are convinced that these variations in human traits and abilities are a reality. Not always are we convinced, however, that these differences are good or that they do, indeed, enter into the processes of learning. Fortunately, there are few among us who would raise the question that was recently put to the author of this chapter. During a discussion of the learning process and of individual differences one student asked, "But how can we do away with these individual differences?"

A discussion of differences among learners properly opens to question the belief that the existence of such differences necessarily supports separation of pupils. Some people take the position that differences among young people (with respect to abilities and performance) make necessary the division of these students into a number of ability levels or groups.

Based upon such logic, the kinds of differences between boys and girls described by Thelen and Lippitt—differences regarding organiza-

tional skills and interpersonal sensitivities—would lead to the conclusion that separate schools, or at least separate classrooms, should be established for the sexes. This approach would have the apparent advantage of matching education to the special abilities of the learner, with the girls seeking to extend their sensitivity to human relationships, while the boys focus more and more upon organizational skills. Would it not be equally logical, however, deliberately to plan experiences to bring these groups together for the purpose of learning from each other? Do sensitivity to relationships and proficiency at organizing tasks represent talents which can be developed to a high level in one group of children and be largely ignored in others?

Denemark claims that we should not be bound by such an "either-or" mode of thinking and says that it *is* possible for an educational program to provide advanced development of special skills and abilities while also providing mastery of certain minimum essentials in other areas. The personal experience of many educators would confirm the significance in their own learning of obligations they have had for teaching others. It is often true that items supposedly learned have not become fully symbolized until the individual has been called on to explain them to others.

A skeptic might well raise this question, "What if the boys don't *want* to learn sensitivity to human relationships, and only want to develop their organizational skills?" The question is provocative, perhaps even defeating, for we have all observed children who do indeed have a particular skill or ability (individual difference) and who want only to exploit this skill or ability rather than learn other skills or become able in other ways. In this connection, Alpert's suggestions are germane. He would probably respond to the foregoing question by saying that if children had the inquiring motive high in their motivational hierarchy we need not be concerned. This inquiring motive would energize the children to find out about other people, about things and about processes in their culture. For example, such a motive would not only serve well a boy's skill in organizing, it would also push him into other significant learning.

Opportunities for learning depend, of course, upon the concept of the roles of teacher and learner which educators and students hold. Undergraduate college students reveal in their comments some significant notions about the roles of teachers and students and about the learning process. Sometimes they will say to a professor, "I learn most when my instructors conduct a straight lecture course." Unfortunately, the quote is almost verbatim. It should be noted that this student perceives himself as *passive* in the learning situation and accords an active role to the teacher. Worthy of note also is the fact that this student

makes no mention of other people in his class or group. Lippitt explicitly indicates that a pattern of classroom operation conducive to learning is one in which each person (including the teacher) subscribes to the group goal of furthering the learning of all persons in the group. In such a setting group members have complete acceptance and understanding of the fact that individual differences within the group help rather than hinder achievement of the learning goals identified and accepted by the group. These two points make patently clear that such a process does not succeed unless the function and responsibility for learning are widely shared in the classroom.

Recurring Themes

As one takes time to reflect on the comments in the preceding chapters certain ideas seem to recur. These "strands" or common elements of individual differences and learning enable us to view pupils differently. Hopefully, these elements will encourage us to work more effectively with children, or to engage in research which will make education a more significant experience in the lives of all persons. What are the major points that emerge in regard to human variability and learning?

Preoccupation with emotional upset deters learning. The research reported by Sarason is especially telling in regard to this point. He shows that anxiety and test scores are inversely related, suggesting that pupils take their anxiety to learning and/or testing situations and the self-same anxiety has an adverse effect on performance. What may be even more telling is that Sarason shows us that high-anxious children are dependent people. Mass education, as practiced in the United States, almost demands that pupils be independent in some of their learning endeavors. A teacher cannot lead by the hand the dependent children in a classroom, for there are far too many demands upon his time and attention. The anxiety of these children, then, almost forces them into a "poor-learning" category.

In this same connection, Lippitt's analysis of the way in which an individual relates himself to a group invites speculation. The pupil who takes the withdrawal solution in regard to the group, is demonstrating that there is a variance between his personal interests and those of the group which, for him, are uncomfortable. The emotional stress generated pushes the pupil into a psychological position that cuts him off from the learning potentially available by his being in the group.

The modes by which one learns are unique. Taylor's chapter should serve as a veritable bombshell to educators! The research he reports is saying to us in rather clear-cut terms that people choose different roads to learning. Those who depart from the school-sanctioned methods of learning may be those who are now being identified as creative. For

example. Taylor tells us that some creative people are characterized by their capacity for redefinition of a problem; others by their tendency to "think at right angles" to the group during a discussion, while still others are divergent in their thinking, i.e., they elaborate and expand on the matter before them. Admittedly, a culture determines *what* people are to learn; but, should a culture have an official mold regarding *how* people are to learn? As one grasps in Taylor's report the conditions in which people are creative, one gets a feeling that it is when the person is not actually required to be like others or when he elects to be different from others.

The uniqueness of one's ways of learning is brought out also in Sarason's research. If the anxiety a person possesses is a dimension of his uniqueness, and if high anxiety predisposes a pupil toward dependency on the teacher in learning tasks, then we see *a mode* of learning predicated by an aspect of individual difference. The kind of person the learner is determines how he shall learn. However, the statement could be turned around and not be invalid. That is, how a person learns determines in part, the kind of person the learner is.

Motives are learned and give direction to learning. It is a standard phrase in education that we "capitalize on the interests (motives) of children." We seem to assume that exercise of the motive will in some way cause pupils to perceive school more positively, to become imbued with the spirit of learning, and, therefore, to learn better. Essentially, this point of view relies on *children* to acquire new motives about learning and their relationship to the school. Exercise of one motive will, hopefully, generate new motives. Alpert now tells us that, since some motives are learned, the teacher can consciously teach children new motives. This would not be done through a course of study or a formal curriculum guide, but through teachers' minute-to-minute relationships with children.

Thelen also alludes to the fact that motives give direction to learning. In his account of the students who gave free-associative comments about pictures of social revolutions, he indicated that the students' comments reflected their motivation. It is this tendency for learning to be selective, because of perceptions of experience and motivation, that probably causes Alpert to suggest that we try to teach pupils the *inquiring motive*. When students are inquisitive they will, perhaps, not only have an avidity for experience, but the experience they accumulate will give them a much broader base on which to make judgments.

The social-emotional climate influences learning. It would be a gross distortion of fact to suggest that this point is something new to psychological and educational thought. Yet, conversations with some teachers would have us believe that learning is something *entirely* dependent on the learner's *inner* perceptions, motivations, goals and self-concept. The

scholars who presented papers during the Fifth Curriculum Research Institute are eloquent in their statements of *external* factors that affect learning.

For instance, Sarason's emphasis on the testing situation as influencing the performance of pupils points the finger to external, or situational, factors and their impact on learning. Indeed, the last section of Sarason's chapter is devoted to suggestions for altering the social-emotional climate so that high anxiety is reduced and learning improved. Thelen presents research data which indicate how much more effectively people learn in groups organized around good human relationships and concerns of the individuals than they do in groups which are "teacher-centered." In a somewhat similar vein Lippitt reviews research which makes clear that the classroom group has a significant impact on the individual as a learner. Alpert's proposed program for the shaping of motives is strongly dependent upon the social-emotional climate created by the teacher. It is important in this connection that Alpert refers frequently to the *rewards* given by a teacher to pupils who engage in a behavior which manifests a certain motive. By virtue of the fact that the teacher has a role in the shaping of children's motives, we admit to interpersonal (social-emotional) factors affecting learning.

Learning is a complex process. It is all too easy to assume that learning is simply a function of the intellect—that one's mental "horsepower" is *the* factor influencing learning. If a teacher falls prey to this assumption he is then apt to place the full burden of responsibility for learning on the pupil. It is obvious that a person's intellectual capacity must influence learning, but there is adequate evidence indicating that high ability students are sometimes poor learners.

The scholars who have contributed to this document assure us that learning has more to it than the exercise of one's intellect. We are told that one's relations with a group determine to some extent how he shall learn, and that his self-concept also is a determinant of learning. To make the picture even more complex, we are told that the *kind* of motives possessed by a person and their arrangement in hierarchy are important factors in learning. As if this were not enough, we are now aware that the level of anxiety a person has will be reflected in his learning.

There is an overarching notion of learning that appears to emerge from the ideas presented in this booklet. The notion is that *learning is a function of the exploitation of one's uniqueness as a person.* If we ask ourselves what it is that makes a person different or unique, it becomes apparent that previous experience, self-concept, motivational structure, ways of relating to a group and perception are a few of the factors that come to mind. Curiously enough, these are the same factors that seem to bear on learning. While rashly proposed, it is sincerely meant that human

uniqueness and learning are reflexive. To say it differently, uniqueness influences learning and learning contributes to uniqueness.

Suggestions for Research

One of the good things about this booklet is that it raises more questions than it answers. Research seems to have the effect on people of causing them always to want to know more. It is good that this is true. A trap we can fall into all too easily is that of taking research findings from one discipline and applying them bodily in the context and setting of another and different discipline. We should not, for example, take some research finding from physical anthropology and apply it directly to an educational situation. Research findings from other disciplines only have curriculum implications. To be used successfully by educators these findings must first be researched in an educational setting.

We present the following problem areas for consideration and possible research. Admittedly these may not be the most important problems to be considered, nor are they a complete listing of problems. Rather, these may serve to illustrate one way in which the papers in this booklet might be used for further research and curriculum experimentation.

1. *How can we determine how children see themselves as learners?*

There is hardly any doubt that one dimension of human variability is the self-concept held by individuals. Much time and effort have been spent to quantify the self-concept, but other dimensions of it need to be studied. We are in dire need of techniques for studying that aspect of the self-concept dealing with the view that a person has of himself as a learner. Once having determined this we can take the next step and attempt to change children's negative view of self as a learner to one that is more positive.

2. *What is the correlation between able, poorly achieving students and creativeness?*

Calvin Taylor indicated that there was a slight negative relation between intelligence and creativity in industrial situations. Is the same thing true in our public school classrooms? Perhaps such a study would tell us whether we are creating an official school mold which children must fit. It may suggest, too, whether the children who do not [illegible] are the more creative children. At this point we can only sp[illegible] answers when we so desperately need facts.

3. *How can the teacher create a learning climate in which it is permissible to say "I don't know"?*

We could hypothesize that children will have less anxiety and will learn better in classrooms in which there is no stigma attached to not

knowing something. Is it possible that such a learning climate would reduce underachievement? Obviously, such a research would necessitate an agreement about the roles of the teacher and pupils in the experimental classrooms. It would be interesting to see whether the "I don't know" climate of learning would cause some children to lose some of their motivation to achieve.

4. *To what extent do teachers distribute the function of and responsibility for learning in a classroom?*

This, too, would be essentially a study to help define some aspects of a climate of learning in a classroom. If learning is an *active* process, as the chapters in this booklet suggest, then we must know (and learn how to measure) how to get children involved in activities that will enable them to take responsibility for their own learning. This is not one of the either-or dichotomies that Denemark writes about in his chapter. It is entirely conceivable that such a research would teach us the *extent* to which we must take responsibility for children's learning and the extent to which that responsibility can be delegated to the children. This would make an ideal action research project for a faculty group to pursue, since all types of activities could be considered and many forms of grouping used.

5. *What can be done to help children develop a positive understanding of individual difference?*

There would be two major purposes in conducting a study to answer the question as posed. The first purpose is entirely philosophical in nature, recognizing that a tenet of democracy is to respect the dignity of the human personality. However, the second purpose is psychological in nature. The quest for and discovery of human variation from one individual to the next in any group could help to identify the group as an agency implicitly dedicated to furthering the learning of all its members.

One could research this problem without creating a curriculum unit or a course of study. Lippitt has stated that the Surprise Package interview in which children pair off and interview each other is a way of helping them to find out how the other person is different. Primary grade teachers will recognize this as a modification of the sharing period so common in our schools. It could be handled also by using a rudimentary projective technique such as asking each child to tell or write what is seen in a picture used, for example, to illustrate work in social studies, industrial arts, physical education, biology or English.

6. *To what extent do teachers' attitudes about grouping affect the learning that occurs in groups?*

One of our commonest educational practices is to give a test to measure some skill, ability or trait and then to group children according

to their scores on the test. We assume that because children possess a comparable skill and are therefore placed in the same group, learning will be facilitated. Note that the *similarity* of children, as indicated by a test score, is regarded as the flux, the catalytic agent that will cause learning to occur.

If the teacher is a member of the classroom group, as Thelen and Lippitt propose they should be, then why should we not admit that the teacher's attitudes about certain kinds of children, or certain degrees of skill, or certain abilities are a factor influencing the children's learning? For example, suppose a teacher regarded high ability readers as snobs, could he disguise this feeling so that it would not adversely affect the children? It is in this regard that Thelen proposes giving teachers "teachable classes"—classes containing children that appeal to teachers.

7. *How can we encourage divergent thinking in classrooms?*

This problem has many facets. We could inquire about the degree to which divergent thinking occurs at present, or the kinds of situations that seem to spawn divergent thinking, or whether it occurs in certain subject matter areas more often than in others. And, if we as teachers could face up to the findings, we might try to ascertain what teachers do when a child, instead of converging his thinking (abstracting, generalizing) begins to expand, to elaborate and to "open up" the subject even more. We should not delude ourselves into thinking that divergent types of learning processes can be the order of the day all the time. Can you imagine 30 children all being divergent at the same moment? The mental picture is reminiscent of anarchy. This suggests we must learn how to create opportunities when this type of learning process is cherished.

8. *By what techniques can we measure learning without using tests?*

We have all known students who "choke up" or become highly anxious when they find themselves in a testing situation. It is serious enough to fail a test, but the situation becomes worse when one recalls that entrance to college and employment often depend upon doing well on tests. Perhaps, as Sarason suggests, we should ask ourselves the question as to why we do so much testing in our schools anyway. The master mechanic need not give his apprentice a test, as we know it. He simply observes what the apprentice does and then makes appropriate suggestions. But if the master mechanic found himself with 30 apprentices instead of one he, as we, would probably have to resort to more structured ways of appraising the performance of his charges. Testing, then, becomes an economy measure. But economy cannot take precedence over the wastage of human resources if, indeed, tests do contribute to wasting the talents of some persons. By all means let us evaluate the learning of our students, but let us be at our creative best in devising evaluative

techniques and devices that go beyond the customary tests and testing situations.

A Final Comment

Having got this far the reader is keenly aware that this booklet has not touched on all those facets of difference that together comprise a human being. We have tried only to identify selected aspects of human variability. We then have sought to explore their relationship to learning. The aspects of human variability discussed in this booklet are those which seemed to the writers to have a more direct relation to the educative process than some other aspects. For this reason we have placed in juxtaposition reflections upon creativity, the contributions of the group to the individual and motivation. Statements made in connection with each of these topics are rich in their implications for the curriculum worker and for the task which confronts him.

At the risk of plucking the same string so often as to produce a monotone, we would conclude by saying that this booklet is not intended to converge thinking or bring closure to thinking. Rather, it is intended to stimulate the reader to further thinking, investigation, discussion and research about human variability and learning.

ASCD Publications

YEARBOOKS

Balance in the Curriculum
Creating a Good Environment for Learning
Fostering Mental Health in Our Schools
Guidance in the Curriculum
Leadership for Improving Instruction
Learning and the Teacher
Look at Continuity in the School Program, A
New Insights and the Curriculum
Perceiving, Behaving, Becoming: A New Focus for Education
Research for Curriculum Improvement
What Shall the High Schools Teach?

PAMPHLETS

Better Than Rating
Children's Social Learning
Curriculum Materials 1963
Discipline for Today's Children and Youth
Elementary School Science
Extending the School Year
Foreign Language Teaching in Elementary Schools
Freeing Capacity To Learn
High School We Need, The
Human Variability and Learning
Improving Language Arts Instruction Through Research
Junior High School We Need, The
Juvenile Delinquency
Learning More About Learning
Matter of Fences, A
New Dimensions in Learning
Self Contained Classroom, The
Supervision in Action
Teaching Music in the Elementary School: Opinion and Comment
Three R's in the Elementary School, The
Using Current Curriculum Developments
What Are the Sources of the Curriculum?
What Does Research Say About Arithmetic?
Child Growth and Development Chart

ASCD membership dues, including Yearbook and subscription to EDUCATIONAL LEADERSHIP, official journal of the Association—$8.00. Subscription only—$4.50. Comprehensive membership (includes all ASCD publications issued during the 12-month membership period)—$14.00.

Association for Supervision and Curriculum Development, NEA
1201 Sixteenth Street, N.W., Washington, D.C. 20036