Conference on Learning Disabilities and Behavior Problems

Introduction

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I have now discharged my duties as chairman and in the ordinary course of events should indicate what a wonderful contribution this has been to my education and thank you for your participation and hard labor. I should also thank Dr. Brainard and her staff and the NIE, and in looking for a suitable quote for such an occasion I found a statement by Yogi Berra at the occasion of Yogi Berra Night, Sportsman Park, St. Louis, Missouri, September 19, 1959: "I want to thank the American Legion, all you baseball fans, club officials, and everybody who helped make this night necessary."

I could now happily turn to more convivial experiences. Unfortunately, this is not to be. I now must put on my other hat, disappear as chairman and reappear as discussant. I feel a little bit the way Zsa Zsa Gabor's next husband will probably feel. I know what to do, but how am I going to make it interesting?

To distill the essence of eight scholarly contributions most of which I heard for the first time today, critically evaluate them and indicate their implications is a task which only a miracle man could perform. I did try to fathom from the guidelines that were laid down what each speaker was likely to say, but having tried to live up to guidelines myself, I know that they are adhered to more in the breach than in the
observance. Thus, my comments would perform deal with what was said only coincidentally.

Fortunately for me, I had prepared an essay a year ago for NIE on its research functions and I shall borrow heavily from this paper since it forms a good background for the discussion, even though few of the paper writers have been exposed to it.

Before discussing the basic goal of this conference, it might be well to set the stage for the role of NIE in the field of research as I conceive it. I will then proceed to deal with the problem of learning disabilities and behavior problems and then indicate the contributions of each of the papers to the solution of these problems.

**Role of NIE in Research**
In order to specify the proper research functions of the NIE, we must first indicate what definition of education we are to adopt. The definition has ranged from education as the job of preparing the individual to enjoy life to the fullest, to education as that which goes on in institutions of learning and teaching. A middle ground escapist definition is to make education equivalent to what educators do.

Viewed from the widest angle available, education is an ongoing natural process characterizing man which occurs spontaneously throughout his life career. This natural educational process probably accounts for the major portion of variance in educational attainment while schooling accounts for only a minor portion. Nevertheless schooling is often a critical steerer of education since like a helmsman, steering a ship, it may inhibit as well as facilitate, and one of the major functions of benign schooling is to permit the natural educational process to continue unhindered. From the point of view of the research functions of the NIE, the naturally ongoing educational process is perhaps too global and too all encompassing to be manageable. Hence, it might be well to focus on a more limited aspect of the educational process as far as research is concerned.

The broadest definition would lead us to regard the educational process as concerned with influencing the development of the innate capacities of the human organism for the better, or the worse. Perhaps a functional definition of education is to limit it to planned intervention in the developmental process of an individual during the course of his entire life with the purpose of optimizing his capacities. This goal of education would apply equally well to normals and to those who suffer from some abnormality interfering with development. In the latter case, optimizing their level of development despite their handicap, or compensatory and remedial training, would be the goal of education. Here, education and therapy may overlap considerably, and this is the main thrust of our conference.

The function of research in education would be as follows: (1) to determine the nature of the developmental process in which intervention is
to take place. This is the basic research needed to permit optimization of functioning; (2) to determine the time sequences in which intervention is most propitious. This involves an understanding of the stages in development; (3) to experimentally determine how the planned intervention could be made most efficacious. This involves research into educational theory, practice, and administration; (4) to determine the type of intervention most suited. This would also involve research into evaluation of outcome.

In conducting research on the educational process we direct our investigation at discovering the variety of forces both internal and external which impinge on the individual throughout life, affecting his behavior in better or poorer adjustment. Educational research is to be distinguished from educational practice. In the latter we try to select those forces which hopefully work towards the better development and greater freeing of man's innate capacities. The purpose of educational research is to provide the basic knowledge for selecting the very best intervention methods for optimizing development as well as permitting natural development to go on uninhibited. Research should facilitate natural growth and eliminate harmful interference with such growth. This diction seems like a straight steal out of the purposes of therapy and just as therapy suffers from iatrogenic effects — disorders produced, albeit unintentionally, by the therapeutic regime, education sometimes suffers from didactogenic effects — handicaps introduced by the all education, the school system, the family and the other educational agents operating on the child. In fact, this entire conference is aimed at research for reducing didactogenic effects to a minimum if we define this process as ill-advised intervention with essentially normal or abnormal children or adults.
We have tried to define the general goals of education and the role that research might play in attaining those goals. However, our concern in this conference is not with the totality of education, but with "Learning Disabilities."

But even with this more limited goal, we must remember that the goals of education, no matter how defined, are usually the results of "a political process, reflecting the result of a (hopefully) successful translation into action of the needs and desires of many groups in the society" as Deutsch, Hammer and Salzinger point out in their position paper. As such, the goals that are accepted are limited only by the wisdom, insight and willingness of the society. The goals of research, however, have quite different limitations. Kedawar has contrasted politics and science as follows: Politics is the art of the possible; science, the art of the soluble.

Research is thus limited not to what is desirable but to what, at this stage of the art, is amenable to solution. That is why, despite some of the more idealistic proposals that one may suggest, we are hampered by what we are now able to do in research, and one of the greatest impediments to progress is the dream of an ideal but, at present, impractical solution.
Definition of Learning Disability

It would have been most helpful if we had defined learning disability prior to the conference so that we could have had better consensus on the definition of the topic at hand. There are a vast variety of definitions of learning disability stretching from those based on neurological lesions and physical handicaps to those based on impoverishment of development arising from a deprived ecological niche. There is, of course, an extensive definition of the learning disabled -- those who fail to benefit from instruction in the expected manner but such a definition is only descriptive, and good as description is, it never cured a disability. We must include the cause of the disability if we are ever to understand or ameliorate the condition.

But before proceeding to etiological considerations, let us draw a line between theoretical and practical definitions of disability. A disability must interfere with functioning if it is to be recognized. Thus illiteracy in a preliterate tribe is hardly a disability. Apparently a disability must be a handicap, if it is to be recognized as a problem. We might apply the definition of defect borrowed from psychopathology. In that field, disorders are separated into progressive and static, progressive referring to disorders that become worse in time (diseases) and static referring to the stationary defects like color blindness or physical defects. While some of the learning disabled pupils become progressively worse in time, the vast majority, like the physically
handicapped suffer from stationary non-progressive disability, though
as they progress through life their handicap may exacerbate their
adjustment difficulties. The characteristics of people suffering
defects is that their efficiency and happiness is severely reduced.
Furthermore, those that have the defect in the vast majority of cases
wish to be rid of it, and those that are free of it, do not seek it,
and society usually provides intervention for the relief of the defects.
These features certainly hold true of learning disabilities.

One may question whether we need a rigorous definition of learning
disability.

It should be realized that arbitrary definitions for operational
purposes is the vogue rather than the exception in the life sciences.
Only in mathematics can we entertain rigorous definitions that bear no
exception. In biology, even such a useful fundamental concept as 'species'
can not be defined rigorously. Julian Huxley (1940) points out that ...
"there is no single criterion of species. Morphological differences;
failure to interbreed; infertility of offspring; ecological, geographical,
or genetical distinctions -- all those must be taken into account, but
none of them singly is decisive ... A combination of criteria is needed,
together with some sort of flair."
But there is still another approach to our problem, one, which in a sense challenges the previous definitions. Its premises are that the number of children now regarded as suffering from learning disability is so large that the very existence of the condition is brought into doubt. When only a small percentage of children fall into the disabled category, society can tolerate them and deal with them by remediation but when nearly 40% of school children in some areas are regarded as disabled, something must be wrong with the system of education which produces the disability rather than with the children themselves. Remedial teaching on such a scale is a misnomer; it becomes an educational system in itself built on the damage it produces. Apparently in such situations, the educational system is geared to expectancies and to tactics and strategies which the local cultures are ill-suited to. In such instances, the local culture itself must be analyzed into its parameters and the educational task must be submitted to an analysis into its fundamental requirements. The analysis of the local cultures ought to be carried on with a view of teasing out those cultural elements which might enhance learning as well as those which impede learning of the externally imposed educational system. Then a correspondence must be sought between the cultural values and the educational requirements which will obviate the possibility of creating educational handicaps. In other words, learning disability is not a natural consequence of children's lacks but of the didactogenic forces unleashed by an ill-suited educational establishment.

The National Advisory Committee on Handicapped Children has recently proposed a definition of learning disability, which despite its vagueness may perhaps have to be either accepted or modified in the light of our conference.
"Finally, a concise definition was formulated by the National Advisory Committee on Handicapped Children in their annual report to Congress in 1968 (p. 4):

Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage.

Congressional legislation concerning the child with learning disabilities incorporates the definition formulated by the National Advisory Committee on Handicapped Children (Children with Specific Learning Disabilities Act of 1969, PL 91-230, The Elementary and Secondary Amendments of 1969)."

The only demurrer that I would like to enter is the exclusion of disability due to environmental disadvantage. This source accounts for such a large proportion of disabilities that it is tantamount to excluding the elephant from the circus.
Etiology

Let us now turn to the causes of learning disabilities. Before proceeding we might as well admit that though our ability to describe the nature of learning disability is modest, we are abysmally ignorant of causes. This holds equally true of both the normal and the disabled. What does one do when surrounded with such abysmal ignorance. We have to resort to our imagination and propose "as if" causes in the form of scientific models and then proceed to test them through observation.

If we take as the goal of education the production of changes in the behavior of the child with the view of optimizing his capabilities be he basically normal or deviant, we might inquire as to the variety of scientific models which have been suggested for the way such changes are brought about. The most popular model for education is that provided by the learning theories.

The influence which education is most concerned with is the learning theory model. The assumptions underlying this model are that all of man's behavior is most influenced by learning and that the laws of learning developed in psychological laboratories occupy the same relationship to education that the laws of physics occupy to engineering. There is a continual flow of new knowledge in basic behavior theory emanating from learning laboratories. These new findings should be translated into educational practice and the required research to make this translation is urgently needed. For example, the House-Zeaman finding on the role of the attention factor in learning in retardates certainly has implications for learning in normals also, and would be something that could be translated readily into educational practice. However, the transfer of learning principles to the classroom has not always proved salutary. What are the other forces that influence man's behavior and modify it?
Fig. 1.
This question, of course, is the very reason why behavioral science was born. In the search for causes in the physical sciences two types of theories developed — the molecular theories and the field theories and some physical phenomena like light, are explicable in terms of both types of theories. In behavioral science, too, we have these two types of theories — the genetic, on the molecular side and the ecological on the field theory side. (include slide of models)

Leaning toward the ecological are the psychological approaches — the developmental-maturational and learning models and on the other hand, leaning toward the genetic are the physiological approaches — the internal environment and the neurophysiological models. (Figure 4)

maturational, (3) hereditary, (4) internal environment, and (5) neurophysiological or brain function.

The ecological model refers to the variety of influences of the social-cultural-physical variety which impinge on the ecological niche that he occupies and shape his behavior. They can modify man's innate capacities for the better or for the worse. Capitalizing on the benign forces and minimizing the malignant forces is the goal of intervention according to this model. This model is largely in the hands of social scientists — anthropologists, sociologists, economists, architects and others — who view man's development as largely due to the field forces to which he is exposed. Many of the recent innovations in the educational field have arisen from this approach.

The developmental model postulates that the transition periods between the various maturational stages that man passes through are the critical points in which his behavior is modified towards better or poorer adjustment.
These transitional stages may be either saltatory quantal jumps as Piaget would have them, or gradual, phasing into one another. The important point, is, however, that they are sequential in an ordinal manner. These stages characterize growth in general and are especially characteristic of the physiological, sensory, perceptual, psychomotor and conceptual curves of development. It is deviations from the expected in the sequential development of these functions which underlie much of what we discussed the past two days. Some of these deviations may be due to events occurring during pregnancy, at birth or in the early neonatal stage, others may come later as a result of lacks in the social environment of the developing child. One of the most striking hypotheses in this area is that of Passmanick and Lillienfeld's continuum of reproductive casualty (explain).

\[ \text{It is in these transitional points that the presence or absence of proper support and nutrient environmental supplies may make for better or poorer development.} \]

The hereditary model stipulates that behavior depends upon the unfolding of the genetic endowment a person is born with. While this is a generally accepted truism, the implications of this model are not always clear and quite recently work based on this model has split the research community into two contending camps -- the genetically oriented (Jensen and Herrnstein) and the environmentally oriented. The simplistic assumptions underlying much of this controversy stem from the expectation that the relationship between heredity and environment is monotonic and holds universally for all traits, abilities and behaviors -- assumptions which should be tested for their tenability rather than adhered to blindly on faith. The net result of this controversy has been a withdrawal of funds for early childhood programs for the disadvantaged -- those who could benefit most.

The internal environment model stipulates that the internal metabolism and body fluids and biochemistry are the determiners of behavior and that the biochemical control of development can be utilized for improving the learning process through nutritional advances, drug intake etc.
The neurophysiological or brain function model stipulates that the way the brain processes incoming information is the basis for learning and that knowledge of brain function is essential for guiding proper development in both normal and abnormal individuals.

These models do not operate independently, and their interactions are often more important than their main effects.

They stipulate the basis for development of behavior in general and underlie any investigation of the alteration and maintenance of behavior. But development is more comprehensive than education. How can we draw a line of demarcation between the two? If we define the educational process as the modification of behavior by environmental input as opposed to internal maturation, we can separate educational from developmental research as follows:

Research which investigates how the planned manipulation of the environment brings about alterations in the behavior of an individual, with the view of increasing or improving the reception and transmission of information and the capacity to act upon it (i.e., the process of communication and the response to its reception), is to be regarded within the province of educational research. This would include the investigation of maturational processes with the view of accelerating or facilitating them (and sometimes slowing them down) in order to enhance their capacity to receive and transmit information and to act upon it. It would include investigations of physiological and anatomical deficits in order to enhance learning. It would include investigations of physiological, sensory, perceptual, psychomotor, and conceptual (cognitive) processes involved in the processing of incoming information and execution of responses to such incoming information. While the line between developmental and educational research is often difficult to draw, one might apply the following line of demarcation: If the investigation is limited to neural transmission processes of information and is not concerned with the enhancement of communication and improvement of adjustment to the environment, it would fall outside the bailiwick of educational research. On further thought, I can conceive of studies of learning in few-celled organisms like aplysia which might have important bearing for education, but perhaps funds for such research could be supplied from sources other than the NIE.
With these scientific models in mind, the reader can proceed to
the contributions of the conference in the next eight chapters and at
the end we shall present a summary of these contributions and an
analysis of the most urgent problems in the field requiring solution.

(end of introduction)
Summary Chapter

The contributions have been analyzed in accordance with the six scientific models that have been proposed in the introduction. Table gives a distribution of the contributions in accordance with the models they employ.

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In the search for some common denominator which might underlie the 6 models that have been proposed we might imagine all of the models squeezed into a cup and examine the common mix for some underlying component. If we did that, we would probably find that the distilled elixir of all the models consists of a vulnerability factor, regardless of how it arose. This vulnerability is probably normally distributed in the population. Pupils with low vulnerability will pass through their educational career without any mishap, while those whose vulnerability is high would require little stress either of an internal or external source to interfere with their scholastic progress.

If we use the label of life events stressors to designate the sources of learning disabilities following our models we can construct a graph relating vulnerability to these untoward life events stressors as shown in Graph 2.

(Graph 2)

These life events stressors vary from lesions in the brain to 'lesions' in the ecological niche and would include for example minimal brain damage in the neurological model, endocrine disturbances in the internal environment model, genetically based disabilities, nutritional and social deprivation as well as didactogenic influences in the ecological model and family disturbances, low motivational level in the developmental model.

If these stressors are sufficient to disturb the individual to a stress level which rises above his threshold, he develops a learning disability, if the stress remains below the threshold, he continues in the normal range.
RELATION BETWEEN VULNERABILITY AND LIFE EVENT STRESSORS

MAXIMUM

LIFE EVENTS STRESSORS

THRESHOLD

NORMAL LEARNERS

LEARNING DISABLED

MINIMUM

LOW VULNERABILITY → HIGH VULNERABILITY
The function of education is to either reduce his vulnerability so as to keep him in the normal learning range, or, so reduce the impact of the life event stressors so as to let the stress remain below threshold. How to measure the degree of vulnerability becomes an important consideration and whether the vulnerability varies from subject matter to subject matter also becomes an important issue. The purpose of therapeutic intervention into the educational process, that characterizes our educational establishment, is to reduce this vulnerability to a minimum and in this way permit normal progress for the pupil in question to occur.

Theoretically, if we had better knowledge of all the processes involved in learning a given subject matter, or in learning in general, we could anticipate the occurrence of a disability from a knowledge of the degree of vulnerability that characterizes a given pupil, and in that way prevent the creation of the disability. Theoretically, too, we could instead of dealing with the concept of vulnerability, deal with the assets and liabilities of the child and capitalize on these to
guide him into socialization with society and equipping him with all the needed skills in a natural way without ever letting him stub
his intellectual toe. This, however, is a utopian dream. Meantime,
we have to realize that the best we can do is equip ourselves with a
measure of the vulnerability of each child and minimize his handicap
and maximize his advantages. Some decades ago, we might have taken
the IQ as our measure of vulnerability, but the recent developments
in the field indicate that it simply predicts scholastic progress in the
currently available curriculum. We need a deeper understanding
of vulnerability independent of the currently imposed educational
standards. One example provided by Dr. Marion Blank comes to mind.
In discussing the types of errors children make, she pointed out that
certain errors seem to characterize the less vulnerable to reading
disability while others characterize the more vulnerable. One of the
dramatic points she raised was that playing with words seems to be a
characteristic belonging to the less vulnerable while the absence of
such playfulness with words is an earmark of vulnerability (get details).

In similar fashion, cross-modal transfer, delayed auditory feedback,
evoked potentials, pgr, effect of labelling, short term memory, and
similar techniques and methods can be used for detecting the vulnerable
child. The whole area of reading readiness and mathematics readiness
when examined with regard to the underlying components may serve to
identify potentially vulnerable individuals. From the ecological side,
the parameters of the ecological niche occupied by the child and his family ought to be surveyed to determine the characteristics of the vulnerable. It is also necessary to examine the didactogenic effects of the educational system and the particular elements in the local culture which interfere with or which might aid learning. In this manner, by identifying the highly vulnerable before they become casualties and by identifying the lesion producing element in the educational system we might avoid much anguish on the part of the child and parent, much unnecessary expenditure in remedial attempts at repairing the didactogenic damage.

**Recommendations**

To be supplied