Doctoral Dissertations 1896 - February 2014

1-1-1982

Education of emotionally disturbed children : a critique of behaviorist trends and an examination of a constructivist alternative.

Carol C. Pope
University of Massachusetts Amherst

Follow this and additional works at: https://scholarworks.umass.edu/dissertations_1

Recommended Citation

Pope, Carol C., "Education of emotionally disturbed children : a critique of behaviorist trends and an examination of a constructivist alternative." (1982). *Doctoral Dissertations 1896 - February 2014*. 3836.
https://scholarworks.umass.edu/dissertations_1/3836

EDUCATION OF EMOTIONALLY DISTURBED CHILDREN:

A CRITIQUE OF BEHAVIORIST TRENDS AND AN

EXAMINATION OF A CONSTRUCTIVIST ALTERNATIVE

A Dissertation Presented

By

CAROL C. POPE

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION
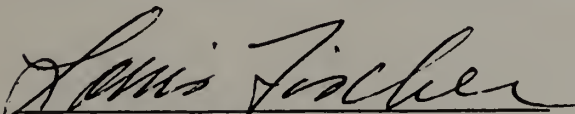
September   1982

Education

EDUCATION OF EMOTIONALLY DISTURBED CHILDREN:

A CRITIQUE OF BEHAVIORIST TRENDS AND AN

EXAMINATION OF A CONSTRUCTIVIST ALTERNATIVE
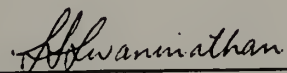

A Dissertation Presented

By

Carol C. Pope

Approved as to style and content by:

Louis Fischer, Chairperson

Philip Eddy, Member

Louise Farnham, Member

Mario Fantini, Dean
School of Education

own slowly coalescing thoughts, his organizational
suggestions and emotional support, all of which made a
welcome difference, and for which I remain grateful.

ABSTRACT

Education of Emotionally Disturbed Children:

A Critique of Behaviorist Trends and an

Examination of a Constructivist Alternative

September 1982

Carol C. Pope, B.A., American University

M.A., Columbia University

Ed.D., University of Massachusetts

Directed by: Professor Louis Fischer

The dissertation examines the currently predominating
behaviorist approach in the education of emotionally
disturbed children. It addresses both epistemological and
pedagogical inadequacies in terms of broad, general
deficits and with respect to shortcomings in four areas
deemed to be critical in the effective education of this
special group: (a) emotional conflict, (b) problems with
social, emotional and cognitive autonomy, (c) the role of
error, and (d) the role of active inquiry.

In preface to the critique of behaviorist epistemology
and pedagogy, an initial section is devoted to an explica-
tion of philosophical and psychological perspectives of the
position. The basic principles of Skinnerian behaviorism
are critically discussed with reference to the theory itself

and the practical implications that follow. As the
behaviorist strategies are assessed in terms of the
learning needs of disturbed children, such strategies
are found to be inadequate in areas of motivation,
transfer of learning, complexity of human thought, and
with specific reference to the four areas mentioned
above.

Finally, the constructivist alternative is
examined, focusing on Piaget's theory and its
implications for educational practice. The study
concludes that a constructivist view provides a more
adequate conceptual and pedagogical model for
understanding the exceptional functioning of disturbed
children. It is maintained that this position serves
as an effective alternative to the dominant behaviorist
paradigm.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

As a part of the general movement of the past two
decades which has given significant social and legislative
attention to children with special needs, there has been a
rising concern about children who are emotionally disturbed
(Safford, 1978; Cruickshank, 1980). Such children are
characterized by excessive behavior that is inappropriate
to situation and age, and is persistent or chronic. While
the degree of severity of this behavior disorder and adaptive
impairment may vary, there are typical constellations of
interrelated symptoms. There is, for instance, a serious
difficulty in establishing contact with peers and adults; an
impaired sense of identity that inadequately distinguishes
self from others; a distorted perception of reality and a
resistance to environmental change; an apparently irrational
level of anxiety accompanying a demonstration of innappro-
priate feelings, a pervasive mood of depression, or certain
physical symptoms such as speech defects or distorted
motility; and retardation in learning capacity on some
level(s) reflected in irregular academic profiles.

Estimates of the incidence of emotional disturbances
among the school population are influenced by variables of

definition and degree of severity. Many authorities, however, agree that close to ten percent of all school-aged children can be classified as emotionally disturbed (U.S. Office of Education, 1975).

An awareness of the extent of this problem, and the special educational and therapeutic needs of disturbed children, has spread among educators, administrators, researchers and the general public. Concommitently, through parental or interest group pressures and legislative mandates, there has been a significant allocation of financial and human resources to assist these children, thereby increasing the educational provisions and opportunities of such pupils.

The vast majority of the programs designed to educate emotionally disturbed children as a part of this recent effort are governed by a behaviorist approach to teaching and learning. This model is essentially based on the principles and prescriptions of B. F. Skinner. In brief, this approach calls for a systematic study of environmental conditions which reinforce behavior in particular ways; these conditions and/or events are then arranged in specific temporal relationships to the behavior in question. Such arrangement is based on a measurement system designed to enable a teacher to identify environmental events which influence the acquisition, maintenance, strengthening, or

disappearance of various types of response patterns.

There are voluminous sources in the literature that attest to the pervasiveness of this behavioristic model as the conceptual guide for programs educating the emotionally disturbed (Brown & Herrnstein, 1975; Bullock et al., 1974; Cowan, 1978; Evans, 1975; Fagen et al., 1975; Forness and MacMillan, 1972; Garwood, 1979; Guralnick, 1977; Hammill and Bartel, 1975; Harshman, 1969; Hewett, 1974; Koch, 1964, 1971, 1976, 1981; Joynson, 1970; Langer, 1969; MacKenzie, 1977; Marx and Goodson, 1976; Meisels, 1979; Payne et al., 1974; Rhodes and Paul, 1978; Safford, 1978; Swanson, 1979; Wedell, 1975; Wyne and O'Connor, 1979).

Statement of the Problem

Despite this major effort to improve the education of emotionally disturbed children there has been a growing number of sources in recent years citing serious problems and inadequacies in such behaviorist programs (Swap, 1974; Safford, 1978; Wood, 1975; Reid, 1978a; Gallagher and Reid, 1981; and Langer, 1969).

Among the various limitations or deficiencies noted in regard to these programs, three problem areas appear to be of central importance. It is proposed here that the major inadequacies are related to the following program characteristics: (a) curricula are typically based on a

limited understanding of the educational and socio-psycho-logical needs of disturbed children; (b) the goals and skills selected are short-term in scope; and (c) reasoning skills and long-term cognitive and emotional growth are under-emphasized.

This view is corroborated by various students of the field. For instance, Miller and Dyer (1975) have shown behavioral educational approaches to be <u>initially</u> effective, but with decreasing success in the long run as compared to approaches based on active exploration. Stallings (1976) supports this contention and further indicates that being taught certain responses does not ensure that the children possess the logic to construct similar responses themselves.

In addition to the general epistemological and educational inadequacies of the behaviorist paradigm addressed in this study, four specific areas will be con-sidered in the failure of this approach to provide appro-priately for the needs of disturbed children:

1. To deal in educational terms with chronic emotional conflict characteristic of disturbed children;

2. To use error productively within the curriculum, as well as in the general milieu of the classroom and school community, rather than merely to avoid it;

3. To elicit active inquiry and cognitive growth; and

4. To foster intellectual, social and emotional autonomy.

Purpose and Significance of Study

In raising questions concerning the adequacy of an educational approach, it is necessary to appraise critically both the conceptual/epistemological foundations of the approach and its pedagogical applications. When this approach is used with a specific population, it is also necessary to assess the appropriateness of this derived pedagogy for the particular needs and characteristics of that population.

Consequently, this study will assess the conceptual and pedagogical dimensions of the behaviorist approach as represented by Skinner, with particular reference to its adequacy for emotionally disturbed children. After assessing areas of inadequacy and the particular developmental needs of this population which are not met by the behaviorist approach, the study will examine the merits and pedagogical implications of a "constructivist" alternative to behaviorism for serving the unmet needs of emotionally disturbed children. The constructivist alternative will be discussed primarily with reference to Piaget's formulation of constructivism.

In considering the prevalent behaviorist approach and the constructivist alternative, particular reference will be made to four critical areas and how they are addressed by the two approaches. These areas are conflict, autonomy,

error and active inquiry. These are chosen for two reasons.
As indicated above, they are crucial in the development of
a healthier direction toward growth for disturbed children.
And the ways in which the areas are addressed differ in the
two approaches and highlight their significant epistemologi-
cal and pedagogical contrasts.

In summary, the purpose of this study is to address
the overall question: "What are the conceptual and peda-
gogical limitations of the behaviorist approach currently
predominating in the education of emotionally disturbed
children, and what is the rationale for, and nature of, a
constructivist alternative?"

In pursuing this overall purpose, the study will deal
sequentially with the following implementing questions:

1. What is the context of behaviorism in intellectual
history, philosophy and the discipline of psychology, and
what are its essential features?

2. What are the epistemological and conceptual
limitations of behaviorism?

3. What are the pedagogical limitations of
behaviorism with particular reference to emotionally
disturbed children and selected learning needs?

4. What is the epistemological and conceptual nature
of constructivism?

5. What is the pedagogical relevance of constructivism

for the emotionally disturbed, and how might it be applied to selected learning needs?

The significance of such a study lies in its combination of a critical assessment of the behaviorist approach for educating disturbed children, the suggested emphasis on four critical areas for analytical and remedial attention, and the elaboration of how such areas are better handled through a constructivist approach. It could serve as a frame of reference for curriculum planners, special education coordinators or teachers, that differs from the prevailaing behaviorist model. Even if the constructivist view were not to be accepted in its entirety, the alternative has value in providing a new perspective from which to examine the current curriculum and needs of the emotionally disturbed.

Hopefully, this perspective and body of recommendations can contribute to learning environments in which active inquiry is basic, error and conflict are treated appropriately, problem solving is incorporated into an individualized and emergent curriculum, and where increasing social, emotional and intellectual autonomy is an emphasized goal for disturbed children.

Scope and Procedure of Study

The term "emotionally disturbed" is used in this paper
to refer to a range of behavior disorders from mild to
severe. It includes children who are pathologically with-
drawn from their environment as well as those who rage
openly against it. For purposes of the study, it does not
include truly autistic children or those whose patterns are
so severe that they could not function outside a residential
placement. Rather, the children of concern here are capable
of living with their families and attending a special day-
school or regular school as main-streamed students or
functioning within the confines of a special needs class.

The issues treated in this study are primarily
epistemological, pedagogical and curriculum-related. Topics
treating the role of the teacher are strongly connected with
these issues, but will be considered beyond the scope of the
study. Nor will there be any attempts to deal directly with
the therapeutic considerations or etiology of pathology in
the children except as they are translated into educational
planning. The study is not designed as an empirical investi-
gation. Rather, the literature will be used to identify
problems inherent in the behaviorist theoretical position
and in the curricular foundation upon which these educational
programs for emotionally disturbed children are based.

This study is based on documentary research, and is

essentially designed as a conceptual study. The preliminary identification, and rationale for selection, of the four critical areas--as already sketched out--is based on an introductory survey of the literature and personal professional experience with emotionally disturbed children. The analysis of the theoretical nature and differences of the behaviorist and constructivist approaches, and the critical examination of their ensuing implications for curriculum with regard to emotionally disturbed children are based on primary and secondary sources. Although there are many other psychologists and educators representing both behaviorism and constructivism, for the purposes of this study Skinner and Piaget will be considered adequate voices respectively to represent each approach.

Review of the Literature

The major categories of literature relevant for this study are those of: (a) behaviorist epistemology and educational applications of the position; (b) constructivist epistemology and its educational applications; and (c) nature of emotionally disturbed children and educational issues or approaches pertaining to this group.

Behaviorism

The basic primary sources in this category will be the writings of B. F. Skinner, with emphasis on The Technology

implications of a constructivist epistemology, as do
Cognitive Development (1977) by Flavell, and Theories of
Development (1969) by Langer.

The Emotionally Disturbed

The literature in this category addresses issues of
specific psychological and educational relevance to emo-
tionally disturbed children. In some, like Meisel's Special
Education and Development (1979), Garwood's Educating Young
Handicapped Children (1979), and Safford's Teaching Young
Children with Special Needs (1978), a developmental
perspective is formulated and the child is basically
viewed as an activist engaged with the environment in
cognitive, affective and motoric ways, not merely as a
passive responder.

Other workds emphasize a more behaviorist-oriented
perspective, as in the following anthologies: Harshman's
Educating the Emotionally Disturbed (1969), and Wedell's
Orientations in Special Education (1975). Another
anthology, Educating Emotionally Disturbed Children by
Dupont (1974), is more eclectic in its approach. Focusing
on disturbed children in educational settings, this latter
work describes the particular needs of these students and
offers various strategies for meeting such needs.

of Teaching (1968), Science and Human Behavior (1953),
and Beyond Freedom and Dignity (1971). In these seminal
works, Skinner elucidates his behaviorist views, the
essential thrust of which is that rewards, threats and
punishments shape human behavior patterns and that a person's
own actions, as well as the environment itself, bring
consequences which in turn shape behavior. Skinner argues
that "people are not in any scientific sense free or
responsible for their achievements" (Skinner, 1971, p. 125).

In this study Skinner's views will be considered
primarily in terms of their epistemological implications
and their educational relevance. He maintains that "the
principal function of education is to transmit the culture--
to enable new members of a group to profit from what others
have already learned. It follows that the principal task
of the student is to learn what others already know"
(Skinner, 1971, p. 149). It is basically a passive system
in contrast to the active nature of a constructivist system.

There have been voluminous quantities of secondary
sources devoted to behaviorism and to B. F. Skinner in
particular. Of these basic sources, those most frequently
used in this study will be Langer's Theories of Development
(1969), Carpenter's The Skinner Primer (1974), and Milhollan
and Forisha's From Skinner to Rogers: Contrasting Approaches
to Education (1972). In addition to such sources which

present, clarify and assess issues within the behaviorist
position, the Seventy-second Yearbook of the National
Society for the Study of Education, which presents an over-
view of behavior modification, is a useful source on current
theories and practices within a behaviorist pedagogy.

Constructivism

Due to the selection of Jean Piaget as the representa-
tive constructivist for this study, primary sources consist
of his works. Piaget's works that most closely address
educational situations and pedagogical perspectives, as
well as those that deal with fundamental psychological issues
which serve as the basis for his educational position, will
be emphasized. These include: Science and Education
(1971b), To Understand Is to Invent (1973), Genetic Epistem-
ology (1970), The Psychology of the Child (1969), and The
Psychology of Intelligence (1950). Piaget maintains that
active participation is required if the child is to trans-
form the data of his environment and thereby to "know" it.

For Piaget, knowing is an activity of the subject and
knowledge is a construction. Knowledge is neither solely
in the subject (knower), nor simply in the object to be
known, but instead is seen as constructed by the subject as
an indissociable subject-object relation. Knowledge is
therefore not static, but is active, dynamic and relational.

Piaget views the epistemological process as a structuring
of the environment according to underlying subjective
structures, or as a structuring of the subject in living
interaction with the environment. His theory when applied
to an educational setting requires an active, inquiring
student who constructs and transforms, rather than passively
absorbs knowledge.

Three excellent secondary sources on the educational
implications of Piaget's epistemology are: The Impact of
Piagetian Theory by Murray (1979), Thinking Goes to School
by Furth and Wachs (1975), and Piaget, Education and
Teaching by McNally (1974). These books share a common
virtue in deriving clear educational strategies based on
an adequate understanding of the epistemology.

There are a number of books and articles dealing with
issues of conceptual development and cognitive growth which
amplify the foundations of a constructivist approach to
education. A two volume set of such articles, entitled
Knowledge and Development (1977, 1978), edited by Overton,
Gallagher and Easley, considers issues of (a) activity in
Piaget's cognitive theory, (b) the psychological guides
for education according to a constructivist perspective,
and (c) the impact on educational growth of interest and
autonomy. Furth's book, Piaget and Knowledge (1969)
provides a preliminary theoretical perspective on the

Organization of Study

The study is divided into six chapters. Following this introduction, Chapter II focuses on behaviorism, its philosophical lineage and place in the history of psychology, and Chapter III addresses the epistemological limitations and inadequacies of Skinnerian behaviorism.

In considering the pedagogical limitations of behaviorism in Chapter IV, the discussion is focused on educational practices and curricula in programs for emotionally disturbed, including descriptions of the learning styles and characteristics of that population. This chapter also deals with the treatment given by behaviorist programs to the areas of conflict, error, exploration and autonomy.

Constructivism, as represented by the Piagetian position, is presented in Chapter V in terms of epistemological foundation and educational implications.

The concluding section, Chapter VI, applies constructivist principles to the education of disturbed children, again with respect to the four areas described above. It then suggests needs for further inquiry and development.

C H A P T E R I I

BEHAVIORISM: PHILOSOPHICAL AND
PSYCHOLOGICAL PERSPECTIVES

The history of behaviorism begins in empiricist
philosophical traditions and unfolds as a major thrust in
the emerging discipline of American psychology. To
understand behaviorism and its powerful influence on
education throughout the last decades it is necessary to
view it against the background of its philosophical
lineage and its place in psychology.

The philosophical forebears of behaviorism, discussed
first in this chapter, are evident but not always fully
acknowledged. They are particularly apparent in relevant
epistemological accounts. Epistomology deals with the
origins and nature of knowledge as well as the nature of the
knower; both of these dimensions are important in construct-
ing a complete philosophical context of behaviorism. A
central link between empiricist epistemology and latter day
behaviorism can be seen in empiricist-inspired "association-
ism"--the view that all complex percepts or ideas are formed
through simple association. This associationist frame of
reference was influential among early behaviorists and in
fact represented an essential element of Skinner's thought

15

throughout his career.

While not acknowledged by Skinner, there are numerous implicit philosophical positions, in addition to that of associationism, behind his thought. And either deliberately or inadvertently he addresses issues that have persistently occupied philosophers and others in the development of western intellectual culture. To ignore this de facto connection with empiricist philosophy and broader philosophical issues would diminish our understanding of Skinnerian behaviorism.

Yet, formally Skinner takes an aphilosophical stance. He is explicit in not providing for, or permitting, a philosophical foundation for his behaviorist inquiry. In effect, he has presided over a particular twentieth century version of psychology-divorced-from-philosophy. This disassociation of psychology from philosophy has not always been the case. Indeed, prior to eighteenth century empiricism, philosophical and psychological issues were essentially the same, and the development of the scientific frame of reference in nineteenth century psychology was clearly associated with empiricist and later logical positivist philosophies. Nor will the divorce necessarily hold in the future; as will be seen, there are indications that philosophy may re-enter the field of psychology once again. But in Skinnerian behaviorism the explicit exclusion of philosophy from scientific psychological inquiry is remarkably

pronounced.

Whether conveyed implicitly or explicitly, this mixture of philosophical and aphilosophical underpinnings of behaviorism needs to be acknowledged and examined as influences.

The second task of this chapter is to place behavior-ism in the context of the historical development of psycho-logy as a discipline. Here the linkages are clearer and more direct. Skinner explicitly acknowledges his roots in psychology and the connection of his formulations with those of earlier psychologists. The behaviorists discussed here share Skinner's attempt to eschew concepts involving purpose, desire, intention, feeling, and so on. Whatever the specific differences between Skinner and his predecessors, they all omit consideration of internal events in favor of relating features of the environment directly to overt behavior.

Building on this discussion of the philosophical and psychological perspectives behind behaviorism, the third and final section of this chapter will provide an explica-tion of Skinnerian behaviorism itself. The basic concepts and principles of Skinner's behaviorism will be described separately and in terms of their places in his system as a whole.

Philosophical Background

Behaviorism is an outgrowth and development from the Empiricist philosophies of Locke and Hume. This seventeenth and eighteenth century tradition, itself a development from an Aristotelian system, displays at its core this central and dominating thesis: a child is born empty--a tabula rasa, an open, untouched wax tablet upon which the impinging environment etches the individual's ensuing history.

This view delineates the notion of mind as copier and computer; the elements of experience are selected, copied, organized, stored and processed according to the quality of the individual's copying equipment as endowed by genetics and shaped by the environment. Empiricism has spawned many forms of thought designed to reduce cognitive mechanisms to a reproduction of reality--a reality having observable features--and the resulting knowledge is then limited to the act of transcribing and transmitting the data as carefully as possible. Human functioning is seen as primarily passive, being buffeted about by an active environment. Thus, a developing individual comes to be who and what he is as a direct result of environmental impact.

The word "empiricism" is derived from the Greek empeiria, from which the English "experience" evolved. The earliest major philosophical use of empiricism is found in

Aristotle, who conceived of experience as the yet unorganized product of sense perception and memory. Awareness of these experiences is something that happens to a person. Indeed, the suggestion of passivity is common to uses of the term empiricism. Knowledge, then, depends on the senses and what is discovered through them.

For Locke, the "essences" of things seemed to escape human knowledge; an external object is finally "an X, I know not what." It is this philosophical skepticism that fostered inquiry into the power of reason and awareness of the limitations of human understanding. It encouraged an expansion of a different sort of knowledge attained through patient observation and meticulous classification. Therefore, it was the richness of experience that accounted for information gained, not a process of rationalizing or coming to the essences of things. This new focus possessed an added bonus from a scientist's perspective: it allowed for the recording of data without the interpretive risk of human decision, arbitrary judgment or subjective bias.

That Locke is an obvious harbinger of the behaviorists to come can be clearly seen in his discussions on the consequences of actions being manipulated for educational purposes. He attempted to formulate laws of thought and a model of the mind based on mechanical concepts and then applied this to educational issues.

According to Locke, without experience there is nothing left of knowledge of geometry or physics, and there is no evidence to support innate human knowledge of anything whatever. Locke was tempted by the newly acquired precision in natural science and sought a parallel precision for analytic psychology in which the mind functions as a kind of Newtonian "empty space" with laws of association determining the ways in which sensations will be conjoined.

As was true for the behaviorists to follow, Locke was interested in the avoidance of error while building systematically on firsthand experience, beginning with the simplest ideas and combining them to form more complex notions that finally serve as the basis for knowledge.* Academic content, comprised of multiple items of information were planned by Locke to be arranged in patterns of association, to be programmed for maximum coverage and efficiency (Axtelle, pp. 18-48). Hume extended Locke's idea of association to sequences of experience. Ideas of complex occurences stem from the association of simple <u>events</u> with one another. The common notion of cause was questioned by Hume as being neither provable by logic nor witnessed via experience. He

---

*It is primarily the associationistic bent for which Lock is remembered and which supplies the historical beginnings of behaviorism. It is interesting to note, however, that he also foreshadowed Dewey in his emphasis on activity and on the education of the whole person (Axtelle, p. 236).

realized that as functioning human beings individuals do not
doubt the reality of their impressions, but that still does
not imply logical certainty and is of limited use in
philosophy. He continued the endeavor initiated by Locke
that would construct a "science of the mind" through careful
observation and description of ideas and "laws governing
their patterns of association."

Taking Locke's ideas onto a second plateau of empiri-
cism, providing the reducto ad adsurdum, Hume analyzed the
process of human thought in the same fashion as he analyzed
the objects of that thought. Thus, thought patterns were
artifically constructed to conform to the nature of physical
objects--an equation of thought process with object
processes.

The empiricist view of mind is essentially analogous
to a mirror, reflecting sensations from the environment;
the source of mental "events" in the mind is always directly
and simply attributable to stimulation from the external
world. The role of the subject-as-actor, constructing
something out of the raw elements of his environment as
they are presented or perceived is largely ruled out.

Empiricism necessarily requires a physicalist view of
the world in which "mental" acts are considered unacceptable
or translated and reduced to physical occurrences. This
aspect of empiricism establishes an environmentalistic

assumption that mental occurences or psychological phenomena are like any other natural event, a part of the physical world or at least are reducible to physical terms in order to be meaningful.

Three essential ingredients of this philosophical model are: (a) that the mind can be analyzed into some form of constituent elements or building blocks such as impressions or associations and that the appropriate connections can be discovered; (b) that external forces are impinging on the relatively passive organism. Thus Locke and Hume argued that knoweldge has its source outside the individual and that it is internalized through the senses; and (c) that the individual passively absorbs and accretes these impressions.

Skinnerian behaviorism is a direct descendant of the empiricist tradition. Skinner has inherited the mantle of Locke and Hume, but with a shift of emphasis from sense impressions to behavioral reaction. Still the focus is on the individual's reaction to environmental stimulation. While there is clearly an advance in scientific methodology within the modern form of empiricism, the basic thrust remains.

Behaviorism in the History of Psychology

Thorndike and Pavlov exerted great influence on the early 20th century development of the field of psychology and paved the way for subsequent classical conditioning advocates such as Watson. While it is true that for thousands of years practices of reinforcement were invoked to change and determine conduct, it was in the twentieth century development of psychology that a more scientific formulation of this ageless concept began. Its major statement is reflected in E. L. Thorndike's law of effect which maintains:

> Of several responses made to the same situation, those which are accompanied or closely followed by satisfaction to the animal, will, other things being equal, be more firmly connected with the situation, so that, when it recurs, they will be more likely to recur; those which are accompanied or closely followed by discomfort to the animal, will, other things being equal, have their connections with that situation weakened, so that, when it recurs, they will be less likely to recur. The greater the satisfaction or discomfort, the greater the strengthening or weakening of the bond (Thorndike, 1898).

Not only was Thorndike's a more precise formulation of this pleasure principle, it was also based on the more solid ground of experimental data.

The subsequent refinements in reinforcement theories have largely been designed to eliminate mentalistic connections either by reducing the reinforcement concepts to the biological processes connected with physical needs or by

disallowing generalizations, permitting only the bare laboratory facts to obtain.

Watson suggested a focus on the behavior of organisms, a focus which would depend directly on sense data. He introduced a form of behaviorism which rejected as mystical all behavior not characterized by observability, or any activity not reducible to a statement of physical responses. Watson's behaviorism focused upon the characteristics of various stimuli producing certain responses, not upon the organism's experience of those stimuli. One result of such a focus is the avoidance of mind-body connections and all related philosophical problems raised by these connections. He was careful to emphasize that his approach did not rule on the presence or absence of consciousness, mental acts or private, internal events. His intention was to change the focus of his emerging discipline to an examination of observable behaviors. A secondary effect of this focus allowed for a consensus to be formed among investigating psychologists working in different contexts because the material was comprised of observable, replicable behaviors.

Watson objected not only to mentalistic frames of reference which depended heavily on introspective inquiry, but he also vehemently attacked the contemporary emphasis on instincts as explanation for motivation. He objected to the assumption that these instincts were innate, mentalistic

and unlearned, that they simply unfolded from within when opportunity called them forth. He denied the inheritance of mental abilities, personality traits or even predispositions.

At the forefront of the movement to change to an aphilosophical orientation, he rejected the functionalism of William James--a heretofore powerful influence in the field--and sought the institution of psychology as a mechanized, objective science.

> Watson's behaviorism sought to sever any last
> remnants of the relations of psychology to
> mentalism and philosophical concerns. Philo-
> sophical terminology was abandoned . . .
> American psychologists . . . were eagerly
> studying the overt behavior of human and beast,
> manipulating them by applying some type of
> stimulus to the organism and recording the
> ensuing response (Sexton, 1978, p. 8).

Elements of shared enterprise among Watsonian, Pavlovian and later forms of behaviorism are: (a) theoretical parsimony, (b) a bent toward practical applications, (c) overwhelming emphasis on reductive analyses of human as well as animal conduct, (d) strict adherence to an associationistic, empiricist frame of reference, (e) rejection of mind-body distinctions, and (f) the thesis that behavior appearing to be the result of mental activity could be explained behaviorally.

Hull, for example, attempted to reduce psychological processes to a kind of biophysics. Behavior was seen as a

means of allowing an organism to resist, remove or alter those conditions which disturb its homeostatic state. A stimulus is always physical in his system. Hull employed an objective stimulus and response analysis of behavior and constructed a classical postulate system which served as a theory. He used this theoretical system to found his notion that no theorem's deducation would be facilitated by the inclusion of mentalistic postulates such as consciousness (Hull, 1942).

This developing trend in psychology had not yet made its impact on education. The publication of Burnham's The Normal Mind (1924) did much to bring about the connection with education and to create a bridge between the two disciplines. He maintained that education consisted of: (a) the selection and description of a task, (b) a plan of action designed to complete the task, (c) freedom to operate according to plan, and (d) the introduction of small incremental steps with little chance for failure in order to condition a positive student response to school tasks.

The subsequent decades, through the forties, witnessed a refinement of conditioning techniques and a broadened application of the principles established in the research of the twenties. There was at this time a tendency to move from negative to positive reinforcement as the effective change agent in operant conditioning.

Later, in the fifties, there was an intensified upsurge in behavioral research resulting largely from Skinner's burgeoning influence. This heightened activity provided the impetus for developing techniques and approaches to be utilized in education and medicine as well as in psychology. At the time this research was initially conducted, proponents on both sides of the "rationalist-empiricist" controversy agreed on the necessity of experience in the acquisition of behavior. But the Skinnerian approach included a determination to proceed as if experience-based conditioning was both necessary and sufficient to explain growth of behavior.

The sixties witnessed an intensified emphasis by psychologists on the connection between the child and his learning environment. A systematic approach ushered in a replacement of the haphazard techniques applied to learning environments in previous research and practice. This orientation with its research findings applied to areas of child management, motivation and classroom discipline became the dominant trend in psychology.

From the 30s, through the period of time described above and into the current scene, Skinner has increasingly influenced the field on both practical and research levels. His view of behavior is that it results from environmental influences, and cognitive events are de-emphasized if not

ignored. Moreover, in this behaviorist view, development
itself is considered a learning process, the study of which
is effected by analyzing the situational conditions that
are antecedent and consequential to the behavior question,
as well as the contingency relationship between the behavior
and its consequences (Berman, 1978).

A major change in the Skinnerian version of behaviorism
is the attempt to remain atheoretical, to avoid any "explana-
tion of an observed fact which appeals to events taking
place somewhere else, at some other level of observation,
described in different terms, and measured, if at all, in
different dimensions" (Skinner, 1950). Skinner has refused
to "biologize" the concept of reinforcement.

> He has refused to explain what makes reinforcers
> reinforcing . . . and resisted the temptation to
> invoke homeostatic notions, notions of 'tissue-
> need' drives, wants, hungers and the like . . .
> Accordingly, the laws of behavioral psychology
> are no more than that collection of reliable
> functional relationships resulting from the
> experimental analysis of behavior (Robinson,
> 1979, pp. 128-129).

The Skinnerian approach is to utilize "operational
definitions," excluding terms not based on observation and
measurement. Reinforcement, for example, is seen in terms
of probability of a given response.

> Only the actual measurements of these probabilities
> permits us to treat a stimulus as a reinforcer.
> That is, there is no a priori classification of
> stimuli as reinforcing or non-reinforcing. Put
> another way, there is no deductive element in
> Skinner's system (Robinson, 1979, p. 129).

Skinner argues that the facts of behavior survive regardless of any discoveries in physiology or neuro-physiology. Like associationistic theories occurring earlier in the history of psychology, the Skinnerian perspective judges the organism as "empty," another kind of blank slate upon which the environment etches. Skinner's aim is to establish functional relationships between behavior and environment independently of knowledge accruing in related fields of inquiry. He holds that "a complete behavioral analysis, leading to functional laws can be conducted without reference to the physiology of the brain, the passions of the animal, or the strivings for succes and happiness" (Robinson, 1979, p. 130).

Skinner's psychology, then, contains a synthesis of elements and characteristics from associationist, behavior-ist, environmentalist and determinist positions. It repre-sents the alignment of philosophical and psychological threads tied together in an atheoretical but amalgamated fashion; it encompasses a rejection of grand systematic thinking, and the exclusive utilization of empirical, observational data-gathering. The Skinnerian system repre-sents also a culmination of the many textures being woven through the field of psychology from the turn of the century to the present.

Skinnerian Concepts and Principles

Skinner's epistemological perspective, as indicated above, is not based on a carefully formulated theoretical position. Indeed, he rejects any formal philosophical stance. Nevertheless, he has been greatly influenced by the empiricist philosophical tradition and, like Locke and Hume, sees association as the basis of knowledge. For Skinner, learning proceeds as an accretion of encounters with stimuli, progressing from simple elements to more complex units of knowledge. Locke and Hume viewed knowledge as utilizing the same building blocks: simple sensations give rise to simple ideas which can be rearranged to form more complex ideas.

This principle of association in the Skinnerian system is assumed

> to govern not only the organization of (a) stimuli
> in the external environment and (b) the impressions
> left by these stimuli upon the person, but also
> (c) the responses of the person to these impres-
> sions and (d) the response habits (tendencies)
> acquired by the person. Elements in the external
> environment are presumed to be there in a state
> of natural association (Langer, 1969, pp. 54-55).

Skinnerian behaviorism includes the following tenets:

1. A materialistic view of the functioning human being and a concommitant rejection of mind-body dualism,

2. A belief that private and public events are functionally similar and are amenable to influence by the

same learning principles,

    3. A rejection of explanatory frames that are
mentalistic,

    4. A belief that the immediate environment is the
primary determinant of behavior,

    5. Employment of scientific methods emphasizing
systematic observation and control of behavior.

    6. A rejection of trait labels in favor of more
specific observation of particular behaviors, and

    7. A predisposition toward amassing laboratory data
without developing elaborate theoretical constructs and
generalizations.

    Skinner is particularly influenced by the empiricists
in his quest for explanations based on observability and in
rejecting the notions of inner causes. Indeed, Skinner
undertakes to make observation the sole index describing
human thought.

The System and Methodology

    The basic premise underlying Skinnerian psychology is
that organisms are basically acted upon by the environment.
Thus,

> the assumption is that the child is born dependent
> upon the environment, which provides the necessary
> stimulation to provoke him to respond if he is to
> survive and adapt. In this the child is like a
> machine which must be set in motion by an outside
> force. In this sense, the environment does not
> constitute the scene of (or occasion for) the

child's behavior. Rather, it is the dominant
actor in the drama of his life (Langer, 1969,
p. 64).

Skinner's methodology is based on a positivistic

perspective, stressing functional and quantifiable relations

gleaned from persistent observation and recording. The

method emphasizes the operationalization of variables and

their systematic manipulation to test hypothesized relation-

ships between behavior and environmental events. "Skinner

believes this role is the only and the total task of

scientific inquiry" (Wolman, 1981, p. 125).

Skinner's method, essentially an inductive one, begins

with empirical data and gradually, if at all, builds toward

tentative generalizations. It implies a general rejection

of classification systems considered by Skinner to be super-

fluous in the effort to change or redirect a particular

piece of behavior. His method incorporates the assumption

that neither mental events nor internal states and processes

are relevant to a proper study of behavior; such a study

can be successfully accomplished without dependence on such

information. Sufficient variables lie outside the organism,

immediately available for observation and study, or can be

obtained from environmental history so that adequate

scientific analysis can be carried out with reference only

to these.

The Principles and Elements

From laboratory investigations based on this methodo-
logical approach, Skinner developed a series of principles
or components that are central to his system. The following
elements, which build upon the earlier empiricists and
behaviorists, are marked by Skinner's particular emphasis.

Respondent Behavior/Respondent Conditioning. According
to basic behaviorist tenets, respondent behavior is elicited
unconditionally by some known and observable stimulus. It
is essentially reflexive behavior, not subject to volitional
control. Associated with this behavior is a directly
related form of conditioning: respondent conditioning, of
which the classical Pavlovian conditioning is the prototype.
A new stimulus is paired with one previously eliciting a
particular response and after a given number of repetitions
the response is also elicited by the new stimulus.

Skinner accepts the importance of this behaviorist
principle only insofar as it explains the process by which
new stimuli come to elicit old responses. He maintains,
however, that this form of conditioning has little impact
on human behavior nor does it explain how new responses
are acquired.

Operant Behavior/Operant Conditioning. Within the
Skinnerian framework, operant behavior and conditioning are
the critical factors in the dynamics of human functioning.

Operant behavior is roughly equivalent to voluntary behavior. It operates on the environment to generate consequences. It is this behavior which serves as the primary focus of Skinnerian study designed to assess how this behavior changes in response to variations occurring in the environment.

Operant conditioning is the controlling behavior in reaction to consequences produced. There is a significant difference between this operant conditioning and the classical conditioning of earlier behaviorists. Both acquire a relation to previous stimuli, but in operant conditioning the prior stimulus becomes the occasion for the operant behavior, but is not an eliciting stimulus. The antecedent becomes the cue for the emission of an operant response; its actual occurence depends on a complex variety of conditions. But it is not the cue-response connection that is important. Rather, the emphasis is on the response and how it is reinforced.

It is often the functional status that renders a behavior operant or respondent. For example, a newborn infant emits cries as primary reactions to hunger or other physical discomfort; that same infant in time uses the behavior differently--as a distress signal for help which has been answered in many instances before. This latter form of crying is dependent on consequences ensuing in the environment and is then considered operant.

Skinner's approach, then differs from earlier behaviorists primarily in this emphasis on response consequences rather than their antecedent stimuli. In what he feels is the absence of knowledge regarding the controlling stimuli for most behaviors, Skinner proposed this operant paradigm which affords a practical system easily applicable to problems of human life.

Thus Skinner revises Thorndike's Law of Effect as follows: "Instead of saying that a man behaves because of the consequences which are to follow his behavior, we simply say that he behaves because of the consequences which have followed similar behavior in the past" (Skinner, 1938, p. 87).

Reinforcement. According to Skinner, the agency that shapes behavior is the process of reinforcement. It is the necessary element in developing and maintaining a discriminated operant. A reinforcer is determined by its effect upon response emission. For Skinner, a stimulus becomes a reinforcer if it increases the probability of a response. That is, it becomes a reinforcer for similar responses emitted in the future and prediction can be made based on the increasing frequency of the behavior.

Thus, when reinforcement follows a given act or piece of behavior, the frequency is likely to increase given similar conditions. Skinner also interprets this the other

way around: any piece of behavior occurring with some frequency is assumed to have been reinforced.

Skinner admits that human action is too complex to make simple connections between cause and resulting action. Instead of dealing with cause and effect he attempts to identify functional relationships between the environmental conditions and changes in the frequency of specific actions. His emphasis is placed on how behavior is modified in relation to environmental feedback, i.e., in relation to the kind, intensity, and frequency of reinforcement.

Positive Reinforcement involves the providing of something desirable to the learner, such as food, money or praise in order to increase the probability of a given behavior's recurrence. A consequence that is pleasantly rewarding to the learner in some way increases the possibility that the behavior which produced that particular response will be repeated.

Negative Reinforcement, contrary to popular understanding, is not identical with punishment. It is the removal of aversive, uncomfortable or unpleasant stimuli, resulting in the increasing frequency of the behavior so reinforced. An individual discovers through experience that he can escape from an uncomfortable situation by exhibiting certain behavior. Having discovered the consequence of escape, the learner is likely to repeat the behavior whose

consequences led to the absence of the unpleasant or negative reinforcer.

Punishment. Skinner views punishment in two ways: (a) as the presentation of aversive stimuli or negative reinforcers, and (b) as the removal of positive reinforcers. He distinguishes between the removal of positive reinforcers to extinguish a response and the withdrawal of a reinforcer when contingent on a response. Only the latter is punishment.

Skinner considers the use of punishment generally inefficient. He proposes instead that society adopt measures of positive reinforcement which are both more efficient and effective. In his view punishment tends to suppress behavior, not change it. The desirable effects of applying punishment are usually short-lived while the undesirable effects, such as anxiety and unhappiness, are often prolonged.

Schedules of Reinforcement. The environment yields rewards in many varied patterns, with changes over time and according to situation. Skinner has thoroughly investigated these schedules, or arrangements of reinforcements, to determine their influence on behavior.

One such arrangement is continuous reinforcement, which represents a one-to-one correspondence between a particular response and a rewarding consequence. It is

primarily the physical, mechanical aspects of human environment which can be characterized as reinforcing in this manner. Devices and appliances fall into this category in which appropriate function (or reward) is expected every time. The higher incidence of consistency in the physical world, as opposed to the human social context, accounts for this kind of reinforcement. Skinner has found that this continuous reinforcement has a disadvantage of producing extremely low frustration levels and concomitant lack of perseverance in the subjects so reinforced.

An alternative pattern of reward is intermittent reinforcement, which does not reward an appropriate act every time one occurs. The social environment or human sphere of influence tends to reward more unevenly, more erratically than the physical environment. The occurence of reward is difficult to predict because the contributing factors are highly complex and dynamic.

There are specific varieties of intermittent reinforcement, based on the dimensions of the interval between reinforcements and number of occurences. A fixed-interval schedule is one in which reinforcement occurs at standardized intervals, e.g., every five minutes, or every six weeks. A variable-interval schedule reinforces at unstandardized and irregular time periods. A fixed-ratio refers

to a schedule which reinforces regardless of time elapsed. In contrast, <u>variable-ratio</u> refers to the reinforcing of responses in varying groups, e.g., after the first two responses, after the sixth, the twentieth, etcetera.

Skinner and his colleagues have examined these varieties of intermittent reinforcement in detail (Ferster and Skinner, 1957). Each variety and its combination with another has been found to have predictable effects on the frequency of operant responses. For example, the fixed-ratio schedule tends to increase persistence and maintain uniform response rates; the variable-ratio produces even greater perseverance with greater extinction resistance. Under a fixed-interval schedule, work output does not remain constant; under a variable-interval schedule, the effect is a high and consistent rate of response, with persistence over time.

There is then a generalized notion of the contrast between continuous and intermittent reinforcement, and their effects in practical application. "The continuous schedule is important in <u>acquiring</u> new behavior. But the intermittent schedules are necessary for building response <u>strength</u>" (Carpenter, 1974, p. 31). Skinner's discovery of this relationship derives from his empirical investigations and consequent application to the experiences of daily life. The recognition of this relationship affords greater

efficiency in the use of behaviorist techniques.

The primary tool in the Skinnerian repertoire is differential reinforcement, which occurs when small changes in performance produce a significantly different outcome. It is the mechanism of shaping through successive approximations that gradually leads to refinements in skilled behaviors. This process can be analyzed into six basic steps: (a) identification of an effective reinforcer, (b) specification of acceptable steps toward that target behavior, (c) selection of an approximate current response to reinforce temporarily, (d) withdrawal of reinforcement once the approximate behavior pattern stabilizes, (e) selection of a closer approximation after behavior has become more variable again, (f) extinction of this new response in favor of a still closer approximation, and so on until target behavior is achieved. Skinnerian use of this form of reinforcement has been widely publicized via pigeon ping-pong.

Control. Psychology's task, according to Skinner, is to predict and control behavior, to generate an effective, efficient methodology with which to accomplish this assign-ment. He believes controls are constantly functioning in any case, so that a more thorough understanding and enlight-ened harnessing of these controls will result in better conditions of life (Skinner, 1953, p. 17).

The thesis of <u>Beyond Freedom and Dignity</u> is that a science of human behavior must be developed, one which will transcend the teleological, "pre-scientific" thinking so objectionable to Skinner. The environmental control exacted on human behavior should be acknowledged and its beneficial aspects encouraged, i.e., seeking the positive reinforcers within this control (Skinner, 1971). The primary aim of his behavioral science is the same prediction and control brought to bear by the hard sciences.

Skinner maintains that human society can, in this modern age, no longer afford to ignore the controlling environment, that an attempt must be made to develop systematic control over those conditions and circumstances that shape human behavior.

C H A P T E R   I I I

BEHAVIORISM: CRITIQUE OF

CONCEPTUAL FRAMEWORK

Before analyzing the appropriateness of behaviorist
pedagogy for the particular needs of emotionally disturbed
children, it is first necessary to assess the soundness of
the conceptual framework out of which that pedagogy is
derived. After presenting a brief overview of major
criticisms, the chapter will discuss a series of limitations
in orientation and concept that characterize this formula-
tion.

Overview

The weaknesses of Skinnerian behaviorism lie, first
of all, in its epistemological limitations. It has failed
to provide any real philosophical foundation for its
enterprise or to elucidate any but the narrowest conception
of science as a process. A related problem is its failure
to recognize in its own functional framework a difference
from the other "hard" sciences with regard to subject
matter. In psychology man is both the inquirer and often
the ultimate experimental subject. The significance of
this relationship is ignored by Skinner, as is the inter-
active dynamic between the two roles, and between man and
his environment generally.

In emulating physics and biology, Skinner has restricted admissability of evidence with a greater intensity than his models. He has honed the criticism of "observability" until its sharp focus rules out much that is relevant in the study of human behavior.

Skinner's preoccupation with amassing detailed data and avoiding theory, as if he were emulating the sciences, results in significant problems. Transferring his data gleaned from animal research to applications regarding human behavior is done on tenuous grounds with concommitent problems concerning the issue of human behavior.

Finally, the failure of a behaviorist system adequately to account for the complexity of human behavior is the most all-encompassing criticism, one which, in the ultimate analysis, might prove most significant.

Rejection of Philosophical Foundations

Behaviorism has, from the inception of its influence, been more concerned with its qualifying as a science than with determining its own broad range of significant subject matter or its appropriate rationales and philosophical bases for selecting that subject matter. "Its history has been largely a matter of emulating the methods, forms, and symbols of the established sciences, especially physics," while actually retreating from the task of constructing its own discipline "and forming rationales for so doing

which could only invite further retreat" (Koch, 1961, p. 629).

The retreat continued. The dramatic split between psychology and any philosophical or theoretical under-pinnings intensified. Sexton (1978) views this alienation from philosophy as a restriction of psychology's true growth as a human science. In its effort to conform to overly narrow conceptions of its enterprise, Skinner's psychology has paid a great price: a loss of direct contact with human experience in a larger pattern of relationships and complexities and a fostering of the view that scientific psychology must be reductionistic. "Individual experience was either ignored or reduced to something else. It became so totally objectified that the person whose experience it was, was ignored" (Sexton, 1978).

Philosophers themselves have reinstated much of what was initially rejected in the positivist era of influence which Skinner continues to maintain. Carnap, as a leading positivist, admitted that

> although many of the alleged results of intro-spection were indeed questionable, a person's awareness of his own state of imagining, feeling, etc., must be recognized as a kind of observation, in principle not different from external observation, and therefore as a legitimate source of knowledge, though limited by its subjective character (Carnap, in Feigl and Scriven, 1956, pp. 70-71).

Skinner's lineage from the empiricists and positivists,

then, continues unabated and virtually untouched despite
the disaffection of scientists and philosophers alike
who now reject these restrictive bases for their own
disciplines. Skinner's behaviorism "is thus in the
unenviable position of standing on philosophical founda-
tions which began to be vacated by philosophy (itself)
almost as soon as the former had borrowed them" (Koch,
1964, p. 5).

Another critic of the objectivist thrust in behavior-
ism is R. B. Joynson, who finds in its record not a
scientific advance but an intellectual retreat. According
to Joynson, behaviorism has either repeatedly failed to
restrict its inquiry to the external conditions it respects
or has attempted to include internal conditions via
indirect methods. In either case, the results are
inadequate. Furthermore, if behaviorists choose to await
advances in neurphysiology on which to found its experiments,
as Skinner often indicates, what difference will they
claim for their endeavor to distinguish it from neuro-
physiology itself? (Joynson, 1970). Waiting for such a
future enterprise is futile--"a future which lifes after
the grave, since that stage is no longer psychology"
(Scriven, 1964, p. 68).

Marx and Goodson (1976) have lent their voices to
this critical outcry. They describe the field of psychology

as currently experiencing a reaction to the intense
behaviorist influence exerted over the last decades. They
forecase a growing revival of interest in philosophical
issues and perspectives, a rediscovery of mind and
consciousness--a revival that would correct what they view
as an imbalance created by a rigid behaviorism.

Failure to Recognize Psychology's Difference from "Hard" Sciences

Skinner ignores the self-referent nature of his
particular discipline. As Scriven (1973, p. 426) points
out, "thinking that p is true never makes it true when p
is a proposition about planets, [yet] the opposite is
often the case when p is about people." This suggests
that Skinner's determination to place psychology parallel
to, say, astronomy or physics will not work because of the
difference in the relationship of inquirer to his subject
matter.

> The inescapable fact is that this belief-
> controllability makes man most unlike planets
> and atoms. In part, it means that some of
> man's internal states which are involved in
> his information-processing and information-
> acquiring activities and of which he is aware
> by his own perceptions of his own brain states
> (i.e., introspection) often dominate his overt
> behavior, explain it, and even control the
> truth of predictions about his later behavior.
> That is what sticks in Skinner's craw (Scriven,
> 1973, p. 427).

This reductionism with particular reference to its
application to human behavior is objectionable to many

critics in trivializing the sum of human functioning. It focuses on small increments, on manageable bits. According to Maslow, Skinner is "guilty of attempting to define the whole phenomenon of the human being in terms of the parts [he] can manipulate well" (Maslow, 1966, p. ix).

Skinner refuses to acknowledge the meaning lost in disallowing a larger picture of human behavior and instead insists that eventually there will be sufficient accretion of data to give a whole picture.

Failure to Acknowledge Interactive Elements

Critics have objected to the obvious lack of interaction within Skinner's behaviorist approach, between subject and object, between the experimenter and the experimental subject, between the knower and the known, and between a person and his environment. As Riegel (1978) views the issue, "the conditioner engages in a lopsided exchange" in which he is unaware of the mutuality of the conditioning process. Instead of viewing this process as a two-way, interactive enterprise, Skinnerians have typically and uncritically retained their biased and assymetric form of empirical endeavor.

Because Skinner fails to recognize the power of the interactive influence, his interpretation of the relationship between experimenter or conditioner and his experi-

mental subject assumes unnecessary restrictiveness.
Breger (1969) accuses Skinner of being "scientistic"
rather than scientific in his method of relating
experimenter to subject in such a way as to set the
experimenter up as "objective fact-gatherer."

Between humans and their environment, the reciprocal
sources of influence are separable for experimental
purposes, but in everyday experience, interaction is
evident and the two exert influence concurrently.
Behaviorists have taken this one-sided paradigm to its
extreme in their mapping of what is functionally a
bi-directional process. Environmental control is over-
studied and overemphasized in the behaviorist literature
whereas personal control is essentially neglected.

There has been much data issuing from the field of
biology demonstrating the constant interactions of
organisms with their environment. The relative passivity
which has been imputed to the organism, particularly by
behaviorist oriented researchers, has become less tenable
than ever. It is, then, the clearly demonstrable activity
even in lower organisms that points to a role for man more
active than empiricist/behaviorist orientations have
allowed.

> The exact counterpart of behaviorist empiricism
> in biologic theory is a doctrine long since
> abandoned by biology itself, not because it was

wrong in what it maintained but because it
ignored all that has since proved essential
to an understanding of the relations between
the organism and its environment (Piaget and
Inhelder, 1976, p. 25).

There is a certain irony in Skinner's contending
that people are controlled by their environment, then on
the other hand suggesting they redesign their society by
applying principles of behaviorism. "If humans were in
fact incapable of influencing their own actions, they
could describe and predict environmental events but hardly
exercise any intentional control over them" (Bandura,
1974). Thus, because of the capacity for reciprocal
influence which Skinner neglects, people are at least
partial architects of their own destinies and are therefore
more active entities in the process than Skinner is
willing to acknowledge.

Rejection of Explanatory Structures

Skinner's interpretation of scientific inquiry in
psychology proves more restrictive than that utilized in
the "hard" sciences he seeks to emulate. Physicists and
biologists might replace inner state explanations whenever
possible with more quantifiable explanations, but they do
not automatically reject what might be meaningful, produc-
tive information simply because it is not quantifiable.

Moreover, there are many examples in these "hard"
sciences where inner states are invoked as significant

explanatory aids. Biology, for example, commonly uses the notion of self-regulation which Skinner would reject as untenable in psychology. He has essentially ignored the use of such terms in other fields and instead tends to see such "internal" concepts as harking back to the pre-scientific, superstitious thinking he hopes psychology will rise above.

An empiricist-based epistemology cannot explain adequately the discipline of mathematics which deals essentially with unobservable features and with cognitive constructions. It ignores the frequent use in other fields of linguistic structures, social structures, atomic structures, mathematical structures, to name just a few. What Skinner fails to acknowledge is that physical characteristics and behaviors do not necessarily exhaust the class of meaningful events (Anderson, 1974; Kuhn, 1970; Hanson, 1958).

"The problem is that as a purely descriptive enterprise with official sanctions against biological and cognitive theorizing, [behaviorism] is not equipped even in principle to embrace such subjects and processes" as found in the study of human behavior (Robinson, 1979, p. 140).

Skinner suggests that the use of such explanatory constructs as self-regulation or cognitive structures puts

an end to inquiry and results in what he sees as incom-
pleteness of explanation. Yet his behavioristic explana-
tion goes no further toward completeness--one can always
question the power of a reinforcer; why is it reinforcing?

Skinner's intense rejection of such constructs is,
of course, throwing out the baby with the bath water.
Contrary to the Skinnerian perspective, science has often
advanced its scope of knowledge by explaining the observable
in terms of the unobservable, e.g., atomic structure.

Skinner assumes that the domain of observability is
rigidly fixed. His blindness in this regard leads him to
repudiate the notion of structural concepts on the grounds
that they are unobservable. But "this policy not only
excludes most of what is usually considered science, but
regulates what is supposed to represent the epitome of
human intellectual achievement to the lowest common denomi-
nator in man's understanding" (Anderson, 1974, pp. 14-15).

The reductionism is the source of voluminous quanti-
ties of criticism from virtually every discipline.
Robinson (1979, p. 138) speaks eloquently of this issue:
"As Skinner . . . has moved beyond the data . . . as he
has attempted to include under the umbrella of the law of
effect the entire range of human activities, the Skinnerian
system has repeatedly foundered and failed." His reduction
of such functions as language, "insight" and "latent

learning" to associational principles has "strained the tether of plausibility."

Critics who attack Skinner for his reductionism are certainly aware of the importance of analyzing behavior in assessing complex concepts. It is true, however, that while a notion like "cognitive structure" cannot be adequately evaluated without reference to specific behavior, this does not imply that the structure can therefore be reduced to behaviors (Anderson, 1974).

Skinner disclaims these constructs because they are "mentalistic." In so doing he confuses the procedures of science itself with terminology.

> He apparently belives that if he rephrases
> mentalistic expressions with terminology
> derived from the laboratory . . . then he has
> achieved a scientific analysis of behavior.
> [Yet] it would be hard to conceive of a more
> striking failure to comprehend even the
> rudiments of scientific thinking (Chomsky,
> 1971, p. 23).

Chomsky views the Skinnerian enterprise as a set of arbitrary restrictions on "legitimate" theory construction-- an unnecessary shackling that physical scientists would find an intolerable abridgement of intellectual pursuit (Chomsky, 1971, p. 23).

Limitations of an Atheoretical Stance

Skinner often implies that a rejection of behaviorism is tantamount to a rejection of Darwinism. A critical

response to this would include the notion that

> the psychological features of human life are
> data that a Darwinian theory must be able to
> explain. Facts are not eliminated by invoking
> a theory unable to account for them. Rather,
> theories are rejected when they are unable to
> assimilate the facts (Robinson, 1976, p. 408).

According to Skinner, we enter upon theorizing when
we ask "why?"--why a reinforcer acts as such. His own
account of his work procedure suggests a simple following
of a trail wherever it leads, disregarding theoretical
constructs, allowing himself as experimenter to be rein-
forced in one direction of investigation rather than
another by the responses of his rats or pigeons (Skinner,
1959, pp. 80-89; 1971, p. 170). Yet, he assumes order is
there to be found and that inner states are irrelevant (a
prejudice reinforced by his selection of rats and pigeons
and not monkeys or men). And he does in fact sort relevant
from irrelevant observations by reference to a given line
of inquiry. Furthermore, he generalizes his findings to
other areas of investigation, e.g., social sciences and
education. These practices all possess theoretical, not
simply empirical procedural elements. "In refusing to
admit that this is the case, Skinner's reductionism is
itself reduced to special pleading" (Hill, 1971, p. 239).

Furthermore, his determination to focus solely on
external behavior itself results in the selection of a
model of sorts--a model which excludes inquiry into more

inclusive and enduring phenomenal systems such as

"dispositions," "personality," "social institutions," etc.

Skinner's comments on these levels of inquiry "imply that

they will only become scientific when the effort is made

to reduct them to itemized accounts of specific overt

responses" (Hill, 1971, p. 232).

Preoccupation with Quantifiable Data

There is a tendency in our modern scientifically-

oriented society to feel comforted that knowledge is

advancing if tables of data are being amassed on a grand

scale. Yet the greatest advances in scientific fields have

come from shifts in perspective, not from the accumulation

of data. Such incrementalism creates a false sense of

progress.

This emphasis on "incrementalism" combined with

Skinner's aloofness toward meaningful theoretical structure

has resulted in a profession in which the measurement is

emphasized out of proportion to its subject matter.

Related to this issue is "mensurationalism," according to

which the validity of an observation is directly propor-

tional to the accuracy of the measurement (Robinson, 1979,

p. 277). But have the important advances in science come

through such tiny, measured increments? The revolutions

of thought sparked by Darwin, Freud, Copernicus or even

Einstein whose theories were recorded in equations were

not significantly couched in terms of incremental observa-
tions or measurement, but rather by totally new theoretical
conceptions in their respective fields.

It is not that what Skinner does is unimportant. It
is rather that it is not all-important. "It will not spell
'truth' no matter how accurate it is; it will not yield a
theory," even though it may figure in assessing one.
"Measurement is an instrument of discrimination, not the
tool of invention" (Robinson, 1979, p. 278).

Skinner has chosen the minor role of measurement,
not a more major one of using measurement to learn some-
thing about nature. Without a cohesive theory, a more
significant role evolving from measuring incremental
changes is unattainable.

The kind of thinking represented in Skinnerian
behaviorism is seen by critics to embody the narrowest
elements and applications of the scientific enterprise.
"It presumes that knowledge is an almost automatic result
of gimmickry, an assembly line . . . regarding knowledge
as the result of 'processing' rather than discovery"
(Koch, 1969, p. 2). Contrasted with intellectual enter-
prises based on the search for meaningful relationships
among elements and ideas, behaviorism appears obsessive
in its focus on such narrow conceptions of inquiry.

Skinner's system fails to account for the full range

of behaviors in even an impoverished Skinner-box environment, and can therefore hardly do justice in accounting for the complexities of human life. Such important and traditional topics of psychology as cognition, concept formation, personality and mentation have been ignored, denied or trivialized.

> We have been badly oversold on the classical
> experimental model as a means of studying
> such central aspects of human psychology as
> cognition. Too much evidence--obvious and
> available evidence--is ignored because it
> fails to conform to our prejudices about
> how empirical information arises (Deese,
> 1969, p. 519).

Problems in Transferring Animal
Research Data to Human Behavior

"The main crack in the tight Skinnerian system occurs when Skinner begins to extend his principles to behavior beyond the laboratory" via methods of analogy and extrapolation (Carpenter, 1974, p. 95). First, there is the question, how far can an analogy be stretched between animal and human behavior? Skinner's rationale for the use of analogy is vague at best. More interesting still is his use of extrapolation, which means to estimate the value or significance of a variable beyond its known range. The weakness of operant extrapolation is that it tends to underrate the complexity of human learning as compared to animal learning. The fact that Skinner has not made any concerted effort to identify the variables

that are peculiar to human learning, that is, beyond those found in the conditioning of rats, places his extrapolations on rather shakey grounds.

In transferring research data from animals to humans Skinner claims two assumptions to be valid: a) the assumption of environmental generality which asserts that a Skinner box, for example, is meaningfully representative of other environments, and b) the assumption of speciea-tional generality which asserts that a pigeon or a rat is meaningfully representative of other species. It is the combination of these two assumptions that forms the basis for Skinner's extrapolations from his research to situa-tions of human behavior.

In less rigidly restricted environments, character-istic of the human experience, "the variability of behavior becomes so great that the only descriptive generalizations that can be made applicable throughout the range of environmental conditions are those so broad and diffuse as to be practically meaningless" (Mackenzie, 1977, p. 162).

The greater attention by critics is directed at the specieational assumption (Beach, 1950; Mackenzie, 1977; Seligman, 1970). There are major differences in behavior of different species even in highly controlled and compar-able experimental environments, differences sufficiently great that there is an observable variability in behavior.

This refers even to the differences between rats and pigeons, a difference which compounds when extrapolated to humans.

Langer questions the utility of behaviorist animal research in its applications to human growth in that it ignores significant differences that would change an interpretation of a given piece of behavior. For example, in Skinner's pigeon ping-pong, people might play to lose so that each gets reinforced more often or to stop playing such a silly game (Langer, 1964, p. 61). These options are clearly not within the pigeon repertoire.

Another aspect of critical response to transfer of animal to human behavior is the complaint that behaviorism fails to recognize the rational and intentional elements of human behavior. In seeking purely observational, descriptive accounts of human behavior, Skinner ignores reasons for behavior, the motivation behind an act which he maintains to be scientifically irrelevant.

Behaviorism fails adequately to account for language, and to consider this facet of human behavior as essentially differentiating humans from other animals. "If a study of mankind does not regard man's possession of language as an essential difference between man and the lower animals, then I should not know what was meant by 'essential'" (Malcolm, 1964, p. 153).

Inadequacy of Skinnerian
Account of Human Freedom

The extremely important and sensitive issue of human
freedom is a crucial epistemological pitfall for Skinner.
He constructs an adamant correspondence between science
and the lack of freedom on the one hand, and between pre-
science and autonomy on the other. It is by no means an
accepted correspondence within the scientific community
(Koch, 1964, 1971, 1976, 1981; Scriven, 1964, 1973;
Robinson, 1976, 1978; Riegel, 1979; etcetera).

In fact, his adamance on this point has itself been
termed unscientific in that he claims science will inevita-
bly show that man is unfree (Skinner, 1971) whereas scien-
tific inquiry dictates that a proposition remain open to
the possibility of disconfirmation (Anderson, 1974).

Scriven poses a less trivial and more dignified view
of human freedom, which he defines as one being capable
and able to do something besides what one does. He main-
tains that freedom

> dwells within and at harmony with the constraint
> of natural and psychological laws. The crucial
> question is not whether our actions are proba-
> blistically determined, but whether they are
> wholly determined by external factors which
> override any variation in mental state--in
> which case we are not free--or whether one of
> the intervening determinants is a mental state
> or event such as preferring or choosing (Scriven,
> 1973, p. 440).

The critics of behaviorism who insist that "autonomous

man" is a meaningful concept are not necessarily maintaining that man's abilities to deliberate, judge or create are totally beyond the natural laws and regularities of the world. They are stating that these behaviors fill everyday experience and behaviorism cannot adequately account for them. It is not a question, then, whether man can disregard physical or natural laws and thereby be autonomous; rather it obtains that man may be autonomous in disregarding the laws of behavior as delineated by behaviorists.

Skinner's notion of freedom is essentially one focusing on its defensive aspect--that is, the freedom from unpleasant, undesirable events. As such, it fails comprehensively to cover all useful definitions of freedom. Actions like thinking, deliberating, reflecting are all unobservable; hence, according to Skinnerian criteria, they are not usable or meaningful in his system. Nevertheless, they do function as forms of freedom. Creative freedom, for example, is not based on avoidance or escape from anything. Rather it is a conscious, deliberate search for innovative alternatives. It is often pursued despite the consequences and though it may itself create more problematic conditions or questions.

Thus, Skinnerian freedom is not broad enough to account for all kinds of meanings of the term.

General Explanatory Inadequacy

It is apparent, then, that many critics believe that neither Skinner's philosophy of science (or lack thereof) nor his conception of (or at least assumptions about) human beings is tenable (Anderson, 1974; Koch, 1964; Robinson, 1976, 1979; Riegel, 1978, among others). It is also clear that most critics find interesting insights and valuable empirical information ensuing from Skinner's method of inquiry. There have been important types of applications based on his studies. It is unlikely that educators or psychologists would deny the value of some of Skinner's contributions. All of this, however, does not serve as justification for Skinner's position as a system of thought or as a sufficient theoretical point of departure for practical applications.

It is the contention of the present study that while the critical appraisals discussed above have merit and touch on sensitive areas of behaviorism, the most important critique remains the claim of general explanatory inadequacy. The point is not that behaviorism is incorrect, but that it is inadequate for the task of explaining all that has been observed about how people learn.

This explanatory weakness of the Skinnerian position is in part due to its resting on a black-box theory of how humans work. "Black-box" refers to a procedural system in

which empirical events are amassed but are not related to
a consistent overarching theory or to an understanding of
the reasons or causes of the events. It is comparable to
an engineer who calculates the tensile strength of struc-
tural members, but does not know why given materials act
as they do. This manner of functioning may, or may not,
be adequate for the successful construction of a building,
but it does not provide a basis for a scientific under-
standing of relevant data or reasons for their occurrence.
When applied to how people learn, observable learning
events are amassed without inclusion of the unobservable
facets or outcomes of the process, without an adequate
theoretical framework for dealing with causation. The
black-box approach explains some things, but not all
things, about learning. It does not provide a truly
scientific basis for inquiry and explanatory analysis,
despite Skinner's protestations of behaviorism's scientific
stance.

The Skinnerian framework presents difficulty in
explaining some important dimensions of the cognitive
process. For instance, while Skinner acknowledges that
internal processes such as human reasoning exist he hardly
does justice to them. This is partly because the phenom-
enon of human reasoning, and an explanation of it, tends
to be elusive for an approach that allows only empirical

data. It stems, too, from Skinner's tendency to lose sight of the interaction between reason and experience.

The approach is also problematic for analyzing or explaining the concept of understanding itself. Deese, for example, came to reject his own experimental background upon confronting its inadequacy in dealing with this concept. He could find no way to link understanding or interpretation with particular behavior, no way to tie them to dependent variables or specific measures of behavior. Yet he notes that

> the concept is central to the theory of human thought, and any attempt to eliminate or ignore it, in the interest of making psychology conform to the reputed canons of experimental inference, is worse than misguided. Such attempts are responsible for the sterility of much experimental study of cognition (Deese, 1969, p. 517).

In other fields, when laws or theories or positions fail to account for all the data, they are usually supplanted by a revised formulation or an entirely different foundation which more adequately accounts for the data. In psychology, critics of Skinner have often turned towards Piaget on these grounds. Thus one critic claims that Skinnerian behaviorism cannot account for the intellectual and moral phenomena described by Piaget, while a Piagetian system of explanation can account for all behavior described by Skinner (Kamii, 1979). Kamii extends this point:

> I have seen many psychologists who changed from
> behaviorist or associationist views to a
> Piagetian outlook. However, I have never known
> a Piagetian who later became a behaviorist.
> Once a person understands a more adequate theory
> (e.g., the heliocentric theory), he cannot go
> back to a more limited outlook (e.g., the geo-
> centric theory) (1979, p. 31).

Can a conceptual framework that has significant explanatory limitations be an adequate guide for an applied pedagogy to meet a broad variety of learning needs? Beyond conceptual considerations, the answer to this must take into account the nature of the learners, how the concepts are applied, and how this serves the critical short and long term educational needs of the particular learning group.

C H A P T E R   I V

PEDAGOGY OF BEHAVIORISM: LIMITATIONS
FOR EMOTIONALLY DISTURBED CHILDREN

When the conceptual foundations of behaviorism are translated into modes of education and training there are a range of issues that emerge pertaining to any learner. Emotionally disturbed children, however, have particular constellations of characteristics and needs which set them apart from more normal populations of learners. For purposes of this study, an assessment of the pedagogical implications of a behaviorist approach must focus on its appropriateness for this particular group.

Consequently, the initial task of this chapter is to summarize some of the major learning characteristics and problems of emotionally disturbed children that must be considered in any pedagogical strategy designed to meet their short and long term needs. Then, after examining the pedagogical implications of behaviorism in general, the problems of this approach for serving the needs of the emotionally disturbed will be discussed. Specific attention is given to the way behaviorist pedagogy deals with emotional conflict, autonomy, error and active exploration. Finally, learning needs unmet by the

behaviorist approach will be identified.

Learning Characteristics of Emotionally
Disturbed Children

Emotional disturbance is a complex notion; its meaning is evasive, ambiguous and multifaceted. Shea (1978) observes that there are as many definitions of the term as there are writers and researchers who address the subject. These definitions vary according to discipline, ideological perspective and the audience for which they were designed.

Most would agree, however, that disturbed children typically present an extreme mixture of intellectual, social and emotional levels of development--a condition which produces difficulties for both diagnosis and prescriptive educational planning. Their perception of the world is often disoriented, vague and confused. Most reveal a totally inadequate comprehension of space, size, shape and sequence, and are unable to cope successfully with the symbols, concepts and abstractions of language and learning (Fenichel, 1969; Hewett, 1968).

There is a connection between the personality characteristics described in the introductory statement of this study and the characteristics described here that pertain more specifically to learning patterns and problems. As with the definition of emotional disturbance

itself, a portrayal of the learning characteristics or problems of disturbed children is influenced by the ideological or disciplinary perspective taken as a reference point. Since this study is concerned with behaviorist and constructivist perspectives, characteristics will be viewed through these lenses.

Perspectives on Emotional Disturbance

Behaviorist theory as applied to emotional disturbance treats the environmental variables that may be manipulated and altered to eliminate the unacceptable behavior. The basic premise is that this maladaptive behavior was originally learned in response to environmental reward of some kind and is equally amenable to "unlearning" if appropriate reinforcement and motivation are provided.

Therefore the behaviorist, in determining the extent and nature of disturbance in a child, looks to the environment. He seeks the locus of the condition in the discrete environments in which the child is functioning, not within an internal state or process belonging to the child. Thus behaviorists such as Ullman and Krasner (1965) find the significance attributed to a given behavior to be dependent on the social context. They define maladaptive behavior as not fitting the expectations set up in the context, not responding to all the stimuli actually present,

and not obtaining typical or maximum forms of reinforcement available to the status of behavior.

Skinner sees the community functioning as a reinforcing agent for the maladaptive behaviors: alter the environmental system of rewards and punishments, and thereby alter the behavior itself. Thus, there is no need within his system to delve into the nature of emotional disturbance. There are simply practical problems connected with certain behaviors which can be modified through appropriate alteration of their environmental impact.

In Skinner's view, maladaptive behavior is controlled by the consequences of that behavior. Deviant behaviors are assumed to have been learned in response to inadequate or inappropriate reinforcement. Such behavior is considered disadvantageous to the individual and/or the group. If the more "advantageous" behaviors can begin to be rewarded in the form of positive consequences following in the environment and if those pairings are repeated often, then there will exist a behavior-environment exchange circuit which, as a result, becomes characteristic of the individual emitting the new behavior.

Behaviorists stress the modification of maladaptive behavior in order to increase the probability of success in, and acceptance by, the environment of the individual child. In accomplishing this task, the underlying core or

causal factors are ignored, as is the concern that the modification and symptom-removal may only mask the real problem.

One way in which Skinner ignores causal aspects of behavior is through his notion of measuring frequency of a given behavior and using the data descriptively. A disturbed child's behaviors, according to this view, may be less bizarre as a whole if they occur less frequently. The focus, then, is on a reduction of occurrences of maladaptive behavior and an increase in alternative, desired behavior. As a result, he bypasses inner causes and emphasizes more normal "appearance."

In summary, the behaviorist perspective on an emotionally disturbed child's disorder is viewed only in terms of observable characteristics and is interpreted as being learned from the environment. The maladaptive learning is derived from the environmental context and its importance is assessed in terms of the frequency with which it occurs.

Constructivists, particularly researchers at the Piaget Institute, view development--and by extension emotional disturbance--as a tightly integrated phenomenon with emotional and cognitive aspects. They maintain that each aspect is dependent on the other and that the two areas must be understood synergistically. "The emotional

and intellectual aspects of development cannot be dissociated, and a study of the dynamics of cognitive function finds its necessary counterpart in a study of the dynamics of emotional development" (Inhelder, 1976, p. 227).

In addition to the bond between emotional and cognitive areas of development, Piagetians suggest that social factors too are intertwined. "The affective and social development of the child follows the same general process [as the cognitive development] since affective, social and cognitive aspects of behavior are in fact inseparable" (Piaget and Inhelder, 1976, p. 33).

There is also a connection between psychomotor and emotional areas of development, as suggested by Wyne and O'Connor: "A developmental view of emotional disturbance requires that the cognitive and psychomotor domains be given appropriate attention in any attempt to understand deviations in the affective domain" (1979, p. 323).

There is, then, in the constructivist view of emotional disturbance, an attempt to structure that view in a wholistic fashion, to incorporate cognitive, affective, social and psychomotor aspects of the child's development. The constructivist frame of reference is a multi-dimensional perspective, based on an integrated approach to the functional problems of disturbed children.

Since the Skinnerian view of emotional disturbance affords no specific explanatory or descriptive picture of the children other than in relation to the environmental contingencies producing the maladaptive behavior, the learning characteristics and problems of the emotionally disturbed child that follow are essentially derived from the constructivist perspective.

Static Modes of Thinking and Learning

Emotionally disturbed children characteristically display strong tendencies toward static connections with the objects of knowledge in their worlds. They experience difficulty in developing operative and transformational schemes and prefer to cling to a developmentally regressed, static and figurative functioning. This extends further into a pronounced inability to expand their focus from present observations to an active establishment of connections with schemes from earlier experience or to make predictions about future outcomes. Anticipation or prediction is difficult as is the representation of spatial transformations.

One aspect of this static functioning is the inordinate attention to detail which is typical of disturbed children. They tend to ignore any general patterns or configurations, and focus almost exclusively on minute details which are often irrelevant to the task

at hand.

Hence there is a general aversion to transformational aspects of their environment in favor of the static elements. "These children resisted making inferences from their own actions, but expected to find their answers in the empirical aspects of the objects, if only they could perceive them accurately!" (Reid, 1978, p. 7). Their tendency is to reexamine, insistently and forcefully, the static elements of a learning situation even though this material has proven insufficient to gain the information or outcome sought.

These children cannot seem to manage the coordination of actions necessary for logical structuring of thought. Instead, each action seems to contain its own separate and isolated causality (Schmid-Kitsikis, 1976; Reid, 1978a), without lending any support to the construction of a generalization or inference that would lead to logical structuring. Thus they seek out fragments and bring an atomistic intuition to bear on the task at hand.

This extreme limitation of abilities to transfer schemes from one situation to another, to generalize, abstract and draw inferences, has been noted by many observers. Cowan (1978) further observed a tendency to cling to past events with a ritualistic fervor; children often mechanically repeated patterns which may or may not

have been appropriate in a previous context but were no longer relevant in a new context.

Research done by Inhelder (1976) has indicated significant problems for disturbed children in dealing with probabilistic reasoning of any kind. They cannot seem to accept or meaningfully process chance phenomena and random events. Instead, they tend to impart highly subjective rationales to explain such random occurence as, for example, the chance patterns in rolling dice or calling out bingo letters. The children are likely to manipulate their interpretation of chance data in order to infuse it with some predictability of their own rigid sort.

The general dominance of static schemes, and thinking patterns related to them, is seen by Cowan (1978) as the basic element of their cognitive functioning which is responsible for ensuing difficulties with object permanence, symbol-referent differentiation, conservation and perspective-taking.

Assimilation-Accommodation Imbalance

Although all children demonstrate some degree of imbalance in their assimilation-accommodation continuum, disturbed children's imbalances have been observed to be more extreme, fluctuate more quickly, occure more pervasively, and last developmentally longer. "The severely emotionally disturbed exhibit eratic and egocentric

behaviors. They tend to assimilate the world to their own subjective needs rather than to attempt to adapt to reality and thereby resist accommodation of assimilative schemes" (Reid, 1978a).

Voyat (1978) concluded that the consequence of such assimilation-accommodation imbalance is a cognitive organization without regard for external adaptation. Such faulty organization results in an equilibrium not simply regressed in a disturbed child, but one that is structurally different from the normal child.

Disturbed children are frequently described as being lost in fantasy, out of touch with reality, obsessively or ritualistically preoccupied with a limited range and interpretation of objects and events. All of these descriptive phrases suggest an overassimilative aspect to their pathology. The children seem to twist and turn the world, insisting that it conform to their own inner needs and interpretations.

There are overaccommodative aspects to their pathology as well. They often react to environmental stimulation in highly distractible and imitative ways. They may merge with surrounding personalities, lacking an awareness of personal identity and sense of self.

This pattern of inconsistency and fluctuation in their assimilative-accommodative approaches to the world

is characteristic of the functional imbalance of emotionally disturbed children. Their social, emotional and intellectual functional discrepancies are concommitant with imbalances between figurative and operative functioning, indicating the intricate bond between functional and structural aspects of development (Cowan, 1978; Reid, 1978a, 1978b).

This connection is corroborated in research data coming from Piaget's Institute in Geneva which describes "permanent or at least very long lasting assimilation-accommodation imbalances [in disturbed children] with resulting imbalance in figurative and operative functions" (Cowan, 1978, p. 337). This Genevan research further suggests that the difficulties demonstrated with object-permanance, symbol-referent differentiation and perspective-taking can be connected with the characteristic dominance of static schemes, as described above.

Avoidance Patterns

These children develop intricate and often bizarre avoidance and withdrawal mechanisms to escape encounters with physical reality as well as with individuals in their environment. The theme of avoidance is a pervasive one in their functional profile; it dominates their activity and apparently their thought processes as well. It is most clearly discernable in their reluctance to encounter

cognitive conflict.

Schmid-Kitsikis (1976) found it impossible to center or focus disturbed children on the contradictions evident in the activities in which they were engaged. They might distort what they see, invent "tall tales" to cover the contradiction or anthropomorphize an inanimate object to explain some feature of the contradiction. These reactions, coupled with digressions and refusals suggest that they need to dominate the experienced conflict in order to avoid its impact on them, rather than acknowledge the conflict and incorporate it into their subsequent strategy-building.

There is often an actual task-distortion on the part of disturbed children designed presumably to avoid the conceptual-perceptual conflict which might be deliberately built into an educational presentation, and presumably to avoid resulting anxiety. Schmid-Kitsikis (1976, p. 247) gives an illustrative example. When one of two equal balls of clay is changed into a sausage shape and a question posed as to equality of quantity, these children tended toward a single similar response: most claimed to be unable to answer unless the two lumps of clay remain the same. A typical statement was "You can't know before they're the same."

These children exhibit tendencies to repeatedly change answers quickly when a problem or question is put

to them and to contradict themselves with successive responses. This pattern is quite different from normal children who might change responses over the course of a learning experience, absorbing the new possibilities demonstrated in the material or in peer responses, and being aware of successive answers as possible corrections.

Disturbed children display no apparent awareness of the inconsistency nor do they reconstruct answers based on new data or changes in peer's positions. In the experiment referred to above, Schmid-Kitsikis (1976, p. 246) describes such an incident: when a disturbed child was confronted with two equal quantities of clay, one of which was transformed as he watched, into a sausage shape, he responded, "Here there is more, and there, there is more." The child could not be urged to experience any cognitive discomfort with his responses.

The avoidance of conflict often is displayed in such failure even to recognize the existence of the conflict. The children may give fluctuating, inconsistent and self-contradictory responses with no apparent awareness of that aspect even when it is raised by the teacher or researcher.

Avoidance, then, is a dominant theme in the learning profiles of disturbed children. They become adept at tactics which avoid subjecting their interpretations of the world to the potentially disequilibrating trials and

tests of experience. Cowan (1978, p. 341) maintains that "ultimately, whatever the motivation, continued avoidance of disequilibrating situations almost inevitably results in structural retardation and further functional imbalance."

Symbol-referent Confusion

Symbolic function presents difficulties for most disturbed children. They are confused by the use of symbols to indicate reality and take the symbols themselves as some form of reality. For example, the word "snake" written on a piece of paper could terrify such a child. Anthony (1965) gives other examples of this tendency which illustrate that signs, semiotics and language are often assumed to possess the same degree of reality as the objects represented by these pictures or words. Another dimension of this confusion is that desires, images or dreams are typically not distuinguished from deeds and actions.

This symbol-referent confusion can occur in children who are extremely bright and can give certain standard indications of a high level intelligence. Schmid-Kitsikis (1976, p. 247) describes a twelve year old disturbed boy who demonstrated a definitional response characteristic of a fifteen year old to the word "knife," citing many functional uses as well as descriptive aspects, after which he fell to the floor proclaiming his fear at pronouncing the

word.

Egocentric Perspective

Because these children demonstrate a lack of differentiation between self and other, between self and external world, they remain at a developmentally delayed egocentric level of functioning. This affects their social, emotional and cognitive areas of functioning. This aspect will be examined more closely at the end of this chapter, in the section on autonomy which is affected as a result of this egocentric perspective.

Impulsivity

Despite individual differences, emotionally disturbed children often exhibit a similar learning problem of being unable to delay response or inhibit an immediate reaction in order to scan memory and experience for possible help in making choices and decisions.

There seems to be an urgency in their response pattern. To postpone closure is evidently uncomfortable for these children; perhaps an immediate answer avoids the anxiety connected with the risk of trying and the spectre of possible failure even though it almost ensures an incorrect, hasty answer.

Impulsivity characterizes their reactions to inter-personal contact and contact with the physical environment

as well. Their inability to delay, to analyze and to
reflect accounts for many of the difficulties disturbed
children encounter in an educational setting.

It is apparent from the preceding account of learning
characteristics and problems that cognitive, affective,
social and psychomotor domains are intensely interactive
and that the source of the formulation or distortion of
perceptions and behavior relevant to learning is found
within the child as much as in the environment. It is also
evident that these characteristics and problems of disturbed
children are more deep seated, extreme and intricately
linked than with normal children; hence it is even more
important with disturbed children for an educational
approach to consider tendencies, learning characteristics,
and predispositions as well as outer states and to focus
on the interplay between the cognitive, affective and
other domains.

An additional complexity of educational significance
is that these children are not simply cases of regressed
development but, as seen in the example of the boy reacting
to the word "knife," may be normal or advanced in some
areas of intellectual development. They typically exhibit
an uneven academic profile. On the one hand, they may be
advanced in certain academic areas; on the other their
intense confusions and distortions subvert their functional

level. This characteristic discrepancy is often revealed in the occurrence of lower level performance on Piagetian tasks than on standard I.Q. measures. These children have often acquired precociously or age-appropriately certain information and skills, but that material is then processed, combined and transformed by lower level cognitive structures (Reid, 1978a; Safford, 1978).

<div align="center">

Behavior Modification in Education of Emotionally Disturbed Children
</div>

Background

Although there were scattered attempts to apply Watsonian and Pavlovian concepts of behavior modification as early as the turn of the century, it was not until the 1960s that this perspective took the educational field by storm. It was essentially the Skinnerian model which exerted great influence throughout the field generally and with specific reference to the subsequently developing sub-field of special education. For educators of emotionally disturbed children, it was considered a productive and efficient change from the then influential psychoanalytic approach. This approach was seen as being diametrically opposed to that psychodynamic model which many educators felt was imprecise and time-consuming, required more technical proficiency than most teachers could demonstrate, and afforded only minimal observable change in the children.

Thus, the field was readily receptive to an efficient, effective, practical model that required little clinical, or therapeutic, training of educators. Indeed, the training required of teachers was more educationally grounded; it required becoming familiar with learning theory, developing an understanding of how reinforcement works, how reinforcers are selected, how to measure frequency and how to set up programs.

The earlier influence of a psychoanalytic approach emphasized the search for inner causes--a task which exacted inappropriate demands of educators. Here, too, behaviorism provided an immediately effective frame of reference independent of inner causes, focusing on accessible, observable, overt behavior--a much more manageable task for teachers.

It is easy to understand, then, the appeal of a system focusing on specific behaviors, immediate feedback, and more rapidly evolving modification of a given maladaptive behavior. Essentially, a more rigid and complex system of thought with regard to educating emotionally disturbed children led to and was significantly supplanted by the simpler, direct, more manageable system of behavior modification.

The psychoeducational approach ironically and inadvertantly paved the way for a behaviorist methodology

which would achieve the goal of supplying an external
framework of stability prescribed by the advocates of a
psychoanalytic approach (Safford, 1978; Wyne and O'Connor,
1979; Hewett, 1974) to counter the children's loosely
organized personal structures. As described by Fenichel
(1969) the children were seen to be disorganized, needing
someone to organize their world for them, to protect them
against their fear of losing control, to help them resist
their impulses. The psychoanalytic group advocated an
educational approach in which the teacher would be the
center of a highly directed, tightly organized setting
designed to apply from without a system of order and
stability upon the children's chaos and disorganization.
Behavior modification advocates continued to place the
teacher at the center of curriculum and reinforcement but
rejected all notions of inner needs or causes.

General Introduction

Behavior modification can be viewed at its most basic
level as a form of teaching by means of extrinsic or
external reinforcement. It is the functional, educational
application of a learning theory--behaviorism--that focuses
on overt behavior and de-emphasizes "mental" or intra-
psychic events. It functions within the field of education
as a kind of behavioral engineering and is considered the
practical outgrowth a "a crusade in the name of empiricism,

materialism or mechanism" (Scriven, 1973, p. 422).

It is a process in which target behaviors are determined, usually by the teacher, delineated in terms of observable behavior, and based on a systematic application of the learning theory derived from experimental research. The successive approximations of the target behavior already occurring are rewarded, responses not approximating that desired behavior are ignored, punished or negatively reinforced. Behavior modification is, then, a systematic arrangement of environmental events organized to produce a specific desired change in observable behavior (Swanson, 1979; Haring and Phillips, 1972).

A behavior modification program designed for emotionally disturbed children is based on the following assumptions: that maladaptive behavior is the problem, not a superficial representation of the problem, and that because a maladaptive behavior is a function of its consequences in the environment, it can be altered by modifying the consequences currently acting as reinforcing agents. It presupposes planned observation and measurement in order to accomplish this.

It is important to note at the outset that many of the following criticisms applied to behavior modification programs are valid only with regard to particular applications. In those cases, it is not necessarily a short-

coming of the behavioral principles which underlie the program, but possibly a faulty interpretation of those Skinnerian principles or a badly planned program.

However, the overwhelming majority of all programs or descriptions of approaches examined in this study possessed some or all of these critical flaws (Andrews, 1970; Baer et al, 1973; Bijou and Baer, 1961; Breger, 1969; Buckholdt and Gubrium, 1980; Catania and Brigham, 1978; Chadwick, 1971; Fagan, 1975; Forness and Macmillan, 1972; Hammill and Bartel, 1975; Hanley, 1970; Haring, 1972, 1974; Harshman, 1969; Hewett, 1974; Hewet et al., 1969; Hilts, 1974; Honig and Staddon, 1977; Hughes, 1980; Kamii, 1971, 1979; Krumbolz, J. and Krumboltz, H., 1972; MacKenzie, 1977; Madden, 1972; Mann and Phillips, 1971; Miller and Dyer, 1975; Morreau and Daley, 1972; Poteet, 1973; Ramp and Hopkins, 1971; Safford, 1978; Shea, 1978; Skinner, 1968, 1973; Ullman and Krasner, 1975; Wedell, 1975; Wyne and O'Connor, 1979). And this remained the case despite attempts by the writer to discover any program descriptions or behavior modification approaches that would avoid these criticisms.

It is the contention of the writer that because of the huge number of cases in point, drawing conclusions about the educational application of behavior modification techniques is valid and worth stating while being mindful

of the above mentioned caveat--i.e., that some of these
criticisms do not necessarily follow from Skinnerian
principles.

The application of Skinnerian principles to
educational settings for disturbed children proceeds
exactly as it would in other settings. Emitted behavior
of the organism is seen as acting upon the environment,
with consequences ensuing, giving feedback to the organism.
In the case of deviant behavior, Skinner maintains that
there is some kind of positive feedback engaging the
children, increasing the probability that such behavior
will recur.

Those in his immediate environment may not be aware
that they have participated in reinforcing the child's
maladaptive behavior, but the reinforcing elements must
be identified and the environmental system of rewards and
punishments altered in ways specifically designed to alter
the behavior. Sequentially, the modification process
proceeds as follows: First, the maladaptive behavior is
explicitly identified, described and its frequency measured
and recorded. According to Haring and Phillips (1974), in
order to qualify as an appropriate behavior for modifying,
the behavior should be couched in observable terms, have
a definite beginning and end, and be repeatable.

Next, a baseline for the occurrence of that behavior

is determined, derived from current frequency of occurrence. This is followed by a careful analysis of the reinforcers in the environment and their relevance to the behavior in question. Often with disturbed children the reinforcers considered are based on Premack's (1965) notion of determining a high probability behavior that is naturally occurring, e.g., enjoying recess, and using that to encourage a low probability, but desired behavior, e.g., staying in their seats during work time.

Teachers must be astute in their observations of any approximation of the desired target behavior. This is particularly true with disturbed children whose behaviors may only slightly and infrequently approach the desired behavior. These approximations must be noticed and rein- forced, according to the plan constructed, with the inten- tion of gradually shaping the behavior toward less disruptive, undesirable or maladaptive behavior. For disturbed children the process may be very gradual indeed and much patience and attentiveness is required from the teacher.

According to Skinner, "behavior, even when it is highly complex, may be shaped in any direction one wishes by differential reinforcement of successive approximations to the desired operant" (Langer, 1969, p. 62).

This paradigm ignores the power or relevance of

causal factors in deviance, and deals only with the behavioral manifestations--which are not viewed as the signifiers of the problems, but as the problems themselves.

Behaviorists pursue a course designed to discover the modifying environmental conditions, analyze relationships between environment and observable behavior and account for the changes in those behaviors.

This technology does not require any acquaintance with esoteric theories or understanding of the symbolic meaning of behavior or knowledge of psychopathology. Instead it places the emphasis firmly upon the individual maladaptive behavior as a function of circumstances in the environment. It is a course of action intended to be applicable to both individuals and groups; to be appropriate for affective, psychosocial and cognitive aspects of functioning; to be easily utilized by personnel with only a moderate amount of training; and to be applicable in a variety of settings.

Critiques of Behavior Modification

This approach, while it has been highly influential and pervasively practiced, is the subject of critical assessments from a variety of sources, directed at a number of its specific policies and procedures. Some of these will be examined in the following section, both in their general application and with particular reference to

the education of emotionally disturbed children. There is
no question, even by its staunchest critics, that the
behavior modification paradigm has been extremely useful
in the education of disturbed children. It is the conten-
tion of this study, however, that the approach is limited
in scope, inadequate in promoting more complex thinking,
and unable to develop self-determined learning or signifi-
cant transfer of learning.

Related to Motivation. The behaviorist position with
regard to motivation is that it is not a useful or meaning-
ful concept. In its place is a highly complex system of
reinforcement designed to explain the shaping of behavior
from external reward and punishment, or, phrased in another
way, from the consequences arising in the environment as
a result of that behavior.

This rejection of motivational aspects of human
behavior has prompted much criticism.

> The most persistent complaint against behaviorism
> is that it fails to recognize the rational and
> intentional element of human behavior [and]
> neglects what some consider to be the most
> important psychological determinant of all;
> that is motivation (Robinson, 1976, p. 400).

In his attempt to excise the concept of intrinsic
motivation from his technique, Skinner is left with a
resulting inability to account for data that appears to
be extremely relevant in deciphering and understanding a
given behavior. Other critics have voiced the same

objection: the behaviorist view of motivation is limited in scope and inadequate to the task of accounting for all human behavior (MacMillan and Forness, 1970a).

Examples of stimulation seeking behavior are not neatly, if at all, explained in the behavior modification approach. Festinger (1957), for example, stipulates that when incoming stimulation differs from existing perceptions or conceptions, motivation to resolve the discrepancy follows. This is certainly an intrinsic form of motivation, not accounted for in the behaviorist technique and, according to Festinger, this cognitive incongruity quite commonly acts as a primary motivational source.

Behavior theory cannot adequately account for children's seeking mastery without any observable or extrinsic reinforcement present. This includes such behavior as a baby's attempts at self-feeding when being fed would surely produce greater immediate reward. White (1965) views this as a significant consideration, one which behavior modification technique cannot encompass. As a result, that paradigm is weakened in its attempt to view motivation as simply extrinsic and observable when significant exceptions occur.

> One is unable to observe the consequences for behaviors that result from exploration, cognitive dissonance, curiosity, and competence as motives. Yet, these sources of motivation must not be ignored or discounted as one attempts to

reach the atypical child (MacMillan and Forness, 1970a).

In fact, disturbed children who tend toward inordinate dependence on authority, have an even greater need than normal children to develop more independent, intrinsic motivations in striving for competence.

The behaviorist's rejoinder to this criticism is couched in asking what is added to the publicly observable connection between response and reinforcer when the notion of motivation is supplied? The answer is formulated in terms of all the exceptions that exist and of all the data for which a behaviorist account does not suffice.

An interesting issue raised by MacMillan and Forness (1970a) is whether the behaviorist emphasis on extrinsic motivation in the form of rewards from the environment impedes the internalized self-rewarding or self-correcting response found to be operative in effective problem-solvers. This self-induced response has been described by Jensen (1968) as most often covert, especially in adults, and consists of implicitly saying "that's right" or "that's wrong" in a self-corrective mode. This feature of effective problem-solving behavior is not the same, the author points out, as external versions, nor do other unrelated rein-forcers typically applied in behaviorist settings function in the same way. The question MacMillan and Forness raise, then, is do behaviorists deprive a child of developing this

internal monitoring device and hinder his problem-solving ability in their use of extrinsic motivation?

The behaviorists' defense against this criticism directed at extrinsic motivation is articulated in the notion of fading out the external rewards gradually so that behavior is then presumed to occur without benefit of such externality. "But the child often doesn't make this shift to independent learning" (Forman and Kuschner, 1977). The point is made also by other researchers in critical appraisal of this crucial aspect of the behavior modification paradigm (Reid, 1978a, 1978b, 1979; Schmid-Kitsikis, 1973, 1976).

Of the many studies advocating extrinsic reinforcement (e.g., Broden, Hall, Dunlap and Clark, 1970; O'Leary and Becker, 1967),

> None appears to have demonstrated control of
> behavior by a) an extrinsic reinforcement system,
> b) fading the extrinsic system while employing
> a self-management program based on an intrinsic
> reinforcement system, and c) maintaining the
> self-managed behavior over time and across
> settings. Moreover, programs which are designed
> to change behavior without a provision for
> permanent maintenance are of little use and may
> in fact be ethically suspect (Wehman, Abramson
> and Norman, 1977).

This raises the related issue of arbitrary vs. natural reinforcers and the general problem of distinguishing between reinforcement for acquisition and for maintenance of a given behavior. Much of the reinforcement used

in educational settings is of the arbitrary kind (Ferster, 1966; Chadwick and Day, 1971; Haring and Phillips, 1972). Teachers are encouraged to set up such reinforcers, e.g., check-marks, tokens, food, etc. Ferster (1966) points out that performances so reinforced are narrowly specified and do not tend to lead to integrated general learning. The fact that there is no functional connection between the arbitrary reinforcer and the target behavior is important here. Furthermore, "it should be noted that while behavior is acquired and strengthened under frequent reinforcement, it is also more easily extinguished whenever the rein- forcement is removed or greatly reduced" (Wehman, Abramson and Norman, 1977). It is, therefore, questionable whether behavior modifiers are actually making this transition to naturally occurring reinforcers.

Scriven (1973, p. 425), too, addresses the issue of performance maintenance in his criticism of the behaviorist approach: "Behavior modification in general has not gone after maintaining performance without external reinforcers." Since such maintenance is at least part of what is usually meant by learning, its absence in the applied programs based on this approach is a significant failing.

This is admittedly a problem of application since teachers' can develop greater emphasis on natural reinforcers if they select and plan well. Yet this is often not the

case. MacMillan and Forness (1970a) suggest the

pervasiveness of this practice and express concern over

its occurrence:

> Teachers employing the behavior modification
> strategy, as they interpret it, have had their
> children on check marks for an entire year.
> When asked the reason the children were still
> functioning at this low level, the teacher
> indicated, 'I'm not about to change something
> that is working!' This teacher has failed in
> her responsibility to bring the child's
> behavior under the control of reinforcers
> that will exist in the child's natural
> environment.

Wehman, Abramson and Norman (1979, p. 229), in an

extensive review of the behaviorist literature on external

reinforcement issues, suggest that problems exist in

changing to natural reinforcers.

> Fading reinforcement contingencies will not be
> sufficent to maintain newly developed behavior
> patterns unless the responses come under control
> of other powerful reinforcers which correspond
> to natural environmental conditions. Perhaps
> behavioral programmers must revise their
> approach to program development.

Because the child often does not make the shift to

independent learning from being extrinsically motivated as

it is described in the behavior modification paradigm, "it

would seem more advisable to use an educational procedure

that seldom uses external reinforcement and thereby obviate

the problem of having to fade the reinforcement out"

(Forman and Kushner, 1977, p. 105).

Another problematic element of this external,

typically positive reinforcement is that it is possibly received by disturbed children as the other side of a judgmental coin. The recipient of such positive reward may become anxious, realizing that although he received praise or reward this time, an inordinate pressure may be experienced to keep up the good work or face feelings of unworthiness. For these children, then, positive rein-forcement holds within it an attenuated negative criticism.

Related to Complex Thought. The behavior modification approach maintains that learning is essentailly learning when to do what with prescriptions for how to accomplish tasks designed in small incremental steps. Yet "the usual learning situation is much more complex than is suggested by the behaviorist paradigm . . . The analysis of human learning in terms of discrete operational steps may ignore or violate the inherent logic in the material to be learned" (MacMillan and Forness, 1970a, p. 293).

According to many critics, this approach also violates the complexity of the learner and of the interactive elements that are in a more dynamic relationship to each other than the behaviorists would acknowledge (Forman and Kuschner, 1977; Furth and Wachs, 1975; Inhelder, 1976; Mann and Phillips, 1971).

Reid (1978) reports that the findings of studies within special education refute the assumption that

disturbed children learn best through the behavior modification orientation which specifies learning through associations typically fostered by repeated exercise and drill.

This prevalent practice of focusing on the more limited, perceptual aspects of thought (Blatt and Garfunkel, 1973) does not do justice to the more complex functions such as generalizing, predicting, analyzing, evaluating and inferring. The behavior modification paradigm ignores the interplay between empirical observation or absorption of perceptual data and the process of reflexive abstraction in which the perceptual information is used in a more generalized fashion leading to logical thinking abilitites.

Criticism is directed also at the incremental units into which a behaviorist curriculum is organized (Forman and Kuschner, 1977; Reid, 1978b; Schmid-Kitsikis, 1976). It is suggested that except in the most simplistic learning situations, the children themselves should discover how to break down a task into small steps. Instead of fractionalizing the curricular task (Mann and Phillips, 1967) into isolated components, a more successful approach would be to develop an easier whole task, one which elicits the highest level of thought process the child can manage and one which has an entire contextual meaning appropriate to his level of understanding.

The fragmented aspects of the disturbed child's intellectual apparatus requires not the fractionalized approach (Mann and Phillips, 1967) current in educational programs designed for him, but the presentation of learning tasks which emphasize the relation between dimensions.

It is difficult at best for this behaviorist approach to foster the more complex aspects of thought while often emphasizing immediate reinforcement, empirical observation, simple perceptions of events, and incremental steps in learning. In fact it is criticized for its emphasis of the perceptual by those who view perception itself to be guided by the structures of thought already formed. According to Inhelder and Karmiloff-Smith (1976), what children actually observe in the empirical world is guided by their theories of what they should be seeing.

This strategy also fails to encourage the kind of frustration tolerance that makes reflective thought attractive (Carpenter, 1974): Given the practical inter-pretation of Skinnerian principles occurring within most classes for disturbed children, it appears unlikely that those precepts which theoretically could be employed to reinforce more reflective thinking are forthcoming. Instead, the classroom milieu for these children is not seen to be hospitable to reflective thought processes (Reid, 1978b, Voyat, 1978; Schmid-Kitsikis, 1976).

<u>Related to Problem-solving and Invention</u>.

> The ability to reason, think abstractly and
> solve complex problems cannot develop as long
> as the child functions preoperationally--that
> is, as long as the child's thoughts are
> dominated by perceived events in the immediate
> present (Wyne and O'Conner, 1979, p. 119).

Abstract thinking and creative problem-solving, then,
require experience with conceptual thinking and the inte-
gration or synthesis of concepts. These complex forms of
thought are fostered through the experience and practice
of viewing objects, events and ideas in terms of relational
aspects or causal connections. Inventive thought also
requires such practice in applying the integrative elements
between objects, events or ideas. The behaviorist approach
neither explains these adequately nor encourages their
occurrence in the classroom.

> Successful invention usually expands freedom of
> action or range of influence and it is pursued
> even when it is not clear just what advantages
> will ensue. Invention often leads to new
> problems, some of which can be clearly predicted
> during the inventive process. But it is often
> rewarding even though it may create more
> problems and aversive conditions than it solves
> or alleviates (Carpenter, 1974, p. 138).

Behaviorist-oriented pedagogy does not by definition
or of necessity eliminate mediational or problem-solving
strategies to enhance the effectiveness of learning, but
in its practical applications does not seem to focus on
this aspect. Moreover, its reinforcement policies lend
themselves to fostering small incremental changes,

primarily in given perceptual tasks or rote learning even though this too is not necessarily so as derived from Skinnerian principles.

This criticism hinges on distinguishing between two kinds of experience. Behaviorists assume there is only physical experience in which information is drawn from the objects themselves. The more abstract form of thought referred to above is based on a form of logical thought, drawn not simply from the object itself but from the child's actions and the coordination of those actions, i.e., the operations and transformations brought to bear on those objects.

If the primary emphasis in a behaviorist approach is on physical experience, the child does not have sufficient opportunity for developing this ability to abstract or utilize logical forms of thought. Such programs fail, then, to provide significant experiences which might promote an awareness on the part of disturbed children of complex relations and abstractions (Forman and Hill, 1980).

Related to Transfer of Learning. As viewed by critics, part of the problem of learning transfer is embedded in the definition of learning and the criteria used to measure it. The critics consider inadequate the behaviorist objective of teaching the child new information in each instance while not fostering the skills required

to acquire new information himself or to restructure the information in a personally significant framework. The notion of learning, then, is too narrow, the criteria too specific in the behaviorist approach. "The behaviorist typically does not focus on information processing but, instead, on the overt behavior, the performance" (Forman and Kuschner, 1977, p. 99). Thus there is a failure to see that learning involves discovering what information is necessary and then applying it to the problem.

The behavioristic approach has the disadvantage of a high rate of false positives--that is, assuming that learning has occurred, when in fact it has not (Kamii and Derman, 1971; Forman and Kuschner, 1977). Kamii and Derman demonstrated the superficial effects of Englemann's behavior modification approach. Engleman attempted to teach a particular task and according to his standards and his post-test, he was satisfied that the children had learned the task. Kamii and Derman then administered a post-test requiring the transfer of that very same material to another similar situation, a task which the children totally failed to accomplish. It would appear that what was accepted by this behavior modifier as learning qualified more as an evidence of rote performance. The children had not _learned_ in any meaningful sense of that term.

Critics of the behaviorist approach admit that it is

often important to look for the occurrence of some specified behavioral criterion in determining if learning has occurred (Forman and Kuschner, 1977). However, this may be a necessary condition but not always sufficient. Nor can the occurrence of the behavioral criterion automatically signal that learning has occurred. If the learning criterion is too product-oriented and based only on a single instance, learning may only _appear_ to have occurred. If the learning does not obtain in a situation of transfer, then it is not a meaningful statement to call it learning.

<u>Related to Transmission of Knowledge Model and Passivity</u>. In a behaviorist orientation, the emphasis in learning is on the human capacity to transmit information. Kamii and DeVries (1977) have shown that the construction of the typical objectives in behaviorist-oriented special education programs is based on the notion that knowledge is transmitted from the environment, usually through the teacher. Their research has demonstrated that such transmission is not a sufficient condition for learning. Acquisition of knowledge depends on a more complex integration of factors than the behaviorist pedagogy allows.

Part of the problem raised regarding the transmission-of-knowledge model is concommitant passivity on the part of the learner. Reid (1978) speculates that the resistance

demonstrated by disturbed children to thinking about their activity, i.e., the reflexive aspects of abstraction, is at least partially related to the emphasis on perceptual stimuli and the passive absorption of information so rampant in the educational programs designed for these children.

Emotionally disturbed children already exhibit strong tendencies to avoid the connections between action and states (Reid, 1978). Emphasis on learner passivity within the classroom environment further exacerbates their problem. It has been suggested that it becomes increasingly difficult for children to participate actively in their own learning experience when the curricular emphasis is on perceptual stimuli and passive absorption of information from teachers and texts (Piaget, 1974).

Because disturbed children are often enslaved by patterns of action they are currently unable to change, it is especially problematic that behavior modification programs do not often provide experience with developing new perspectives, generating alternatives or recognizing relationships and transformations between objects and events. If these experiences were provided, they would have the effect of expanding the children's view to include the development of more transformational, change-oriented thought processes, and as a result help them focus less on

only the static elements in situations that they are involved in socially, emotionally or academically.

    <u>Related to the Teaching Process</u>. For Skinner, the educational process, and the teaching process in particular, is simply the technique of arranging the contingencies of reinforcement under which children learn. Teachers must set up consequences, occurring in the school environment, that follow from the child's action, emphasizing positive reinforcement.

    Behaviorist-oriented pedagogy supports a closely-structured, teacher-centered learning environment in which control is an important element. The teacher is the primary controlling agent, functioning in that capacity through his selection of information to be learned and construction of appropriate situations to accomplish stated goals via manageable incremental steps and reinforcing of behaviors that approximate the desired learning.

> Since learning may be defined in terms of responses to discriminative stimuli under conditions of reinforcement and since teachers are charged with the task of arranging these so as to promote learning (Skinner, 1968), it follows that in a very real sense learning is held to be contingent upon teacher behavior (Wedell, 1975, p. 73).

    Behavior analysis fails to provide an adequate basis or framework from which to select educational goals (MacMillan and Forness, 1970). The methodology which is so powerful in terms of changing maladaptive behavior to

more acceptable behavior is not matched by concern for how broad educational goals are determined. "Teachers are provided with an efficient means of taking emotionally disturbed children someplace but are not substantially aided in the selection of where to go" (Hewett et al., 1969, p. 525).

Lacking a developmental framework, as would be provided in other systems, e.g., Piagetian or Deweyan, the teacher is left with a certain gap which is filled on the basis of arbitrary decisions. Grass and Kreger (1978) criticize the wide-scale use of performance objectives which provide a generalized list of sequential goals without being limited to any specific developmental hierarchies and without offering any guidelines for methodological intervention.

Wood (1968) and MacMillan and Forness (1970a) express concern that teachers may be provided only with the powerful technical tools of behavior modification and not equipped at the same time to understand its implications and potential misuse. These techniques have the marked disadvantage, as do many such tools, of being morally blind. It is relatively easy to learn the applications of the technique, but there is usually no concommitant training of teachers in the ramifications of its possible abuse.

Conclusion

Behavior modification, according to MacMillan and
Forness (1970a)

> gives no direction in determining educational
> goals; it reduces constructs of learning,
> motivation and reinforcement to simplistic
> terms on occasion. To the unsophisticated
> practitioner, it may be blinding to broader
> frames of reference . . . and may preclude
> children from learning how to learn and thus
> becoming independent of teachers as such--a
> major goal of education (p. 296).

Critics warn against the confusion of an appropriate
use of behavior modification techniques as an _expedient_
to make certain aspects of education and classroom organi-
zation possible for disturbed children, with the inappro-
priate use of the approach as a _means_ for constructing
knowledge (MacMillan and Forness, 1970a; Forman and
Kuschner, 1977). Education, according to this critique,
is more than a change in behavior, but particularly with
disturbed children, it is an increase in consciousness of
self and in awareness of the transformations regulated and
coordinated by the learner. Behavior modification is not
ideally suited to or designed for eliciting awareness of
actions performed--an awareness that is crucial for
disturbed children both in organizing their meager sense
of self-as-actor and in discovering the transformations
that can be made on objects and ideas in order to avoid
their predominantly static modes of learning.

This approach, with its system of external reinforcements, tends to promote the learning of specific facts in piecemeal fashion. Given the fragmented quality of a disturbed child's learning profile, this fractionalized curriculum with separate isolated pieces of information fosters neither the development of a more organized network of knowledge nor the developmental processes necessary in acquiring and constructing knowledge more independently.

"Behavior modification may be an effective means to produce or eliminate certain [maladaptive] behaviors that prevent the child from interacting with the materials" (Forman and Kuschner, 1977, p. 118). However, once a child is focused on the materials, this approach is inadequate to encourage the necessary exploration, self-invoked questioning, determining of relevant problems and searching for appropriate information that is required for disturbed children to improve their social, emotional and cognitive skills.

It should be clear from the general appraisals of this approach that much of value can be derived from the behaviorist paradigm. Its critics would agree with MacMillan and Forness (1970a) that this "strategy has tremendous potential for work with atypical children; but although its use with these children is promising, its misuse could be terrifying."

Four Selected Areas

Four areas have been singled out for specific consideration in this study: a) emotional conflict, b) problems with social, emotional and cognitive autonomy, 3) the role of error, and 4) the role of active inquiry. The first two have their origins in the problematic and pathological development of disturbed children, while the latter two originate within the educational setting in which the children function. They are selected for closer examination because they indicate together the interactive and reciprocal impact between the nature of these children and their environment. The problems experienced with conflict and autonomy result in pedagogical problems for the children and the roles of error and active inquiry are likely to affect their social and emotional as well as cognitive development.

Furthermore, these areas were selected because they focus on aspects of emotional and educational growth that have long-term impact on development, as opposed to the short-term, specific aspects usually considered by the behaviorist approach; and because these areas are inadequately addressed by this approach.

Emotional Conflict. Emotional conflict appears to be a common element in disturbed children regardless of the variations in specific problems. Its genesis may

proceed from a variety of emotional, psychological, physiological, social and environmental factors beyond the scope of educators to assess. Yet its existence within these children is a pervasive and powerful force to consider in educational planning.

In more normally functioning children, conflict can be evoked through occasional specific events and anxiety may well result. This is part of a healthy, well-functioning human response system. Yet emotionally disturbed children demonstrate a quick and continuous response to situations that would ordinarily seem uneventful and not apparently appropriate causes for conflict. It is the chronic nature of the phenomenon that renders it so powerful; its pervasiveness in these children affects virtually every experienced event.

This chronic conflict can be viewed as a characteristic readiness to react with emotional charge in response to real or imagined dilemmas. It is manifested in a variety of ways in classroom behavior; sudden outbursts of rage, anxiety attacks over small decisions, agitated movement and verbal responses, inability to utilize sufficient self-calming tactics, intense hyperactivity or sullen, passive withdrawal.

Existing behaviorist-oriented programs tend to treat the conflict superficially and symptomatically, utilizing

strategies that attempt to eradicate the behavioral
manifestation. This teaching strategy does not allow, much
less encourage, the child to deal actively with his own
conflict; it does not foster the construction of a reper-
toire of his own tools with which to "tame" the anxiety
and panic resulting from this conflict.

An analogy here might be helpful. In the case of
beginning instrumental string-players, correct intonation
is a most fundamental problem and is very difficult to
attain. The aural dissonance usually present can be viewed
as analogous to inner conflict. One educational strategy
is based on constant, external correction: "That's too
sharp. That's flat. Your hand is too high on the finger-
board." This approach attempts to eradicate the dissonance
directly from without by changing the existing behavior.
A contrasting approach is to have the student learn to hear
the dissonance, to become in-tune with his own "out-of-
tuness" and through this to begin to change his intonation
accordingly because of his own internal dissatisfaction.
He then begins to develop a repertoire of his own tools
to help attain this goal. Educationally, this would trans-
late into programmatic planning that would provide experi-
ence in handling cognitive dissonance--a different kind of
conflict that is external and manageable.

A significant problem resulting from the first

approach is the lack of transference. The student learns only a mechanical piece of data, e.g., "If I keep my hand lower, I won't play too sharp." Whereas, the contrasting approach leads to an internalized system of discrimination that can then be applied to other areas of music to deepen the understanding and broaden the scope of knowledge.

Current programs of the behaviorist mold tend to ignore the connection of the child's inner conflict with the educationally productive use of cognitive conflict. Simply providing an environment of reduced conflict will not modify the way in which the child experiences and interacts with the world. In fact, his view of his own turmoil may be intensified in this way. It is an age-old solution to temper with an opposite, whereas here the metaphor of innoculation might be more appropriate.

In failing to introduce manageable cognitive dissonance, current programs fail also to promote coping strategies so vital to the educational growth of disturbed children.

Intellectual, Social and Emotional Autonomy. The initial development of autonomy begins with the onset of some level of abstraction, i.e., the acquisition of a mental representation of "other" in the infant's development and a growing awareness in time of the separateness of self. This is closely connected with the development

of object permanence in both its forms--with reference to
the permanence of material objects. This developing skill
evolves into the ability to retain a mental picture or
image of the object when it is no longer in view. It is
also referred to as object constancy and is used with
reference to both people and material objects.

This process is somehow short-circuited in most
disturbed children. As a result, first there is a loss in
object-constancy of meaningful others in their lives, and
following that a possible delay in developing object
permanence of material objects. This developmental delay
causes problems for disturbed children in their sense of
their growing separateness as individuals, and concommit-
antly with their growing conceptual frameworks. This
connection between intellectual and emotional autonomy has
been documented by Feffer, Feffer and Gouravitch, and
Feffer and Suchotliff (in Overton and Gallagher, 1977).

Related to this is the child's ability to recognize
and empathize with others, to acknowledge their perspective,
to accept his own boundaries as well as the boundaries of
others. Emotionally disturbed children tend to experience
a great deal of difficulty with the socio-emotional aspect
of this developmental task and a connected difficulty with
its cognitive counterpart which is seeing issues, events
and models from other perspectives.

It is necessary for an educational setting to provide an active role for the disturbed child in learning his own parameters and to encourage respect for the perspectives and boundaries of others in order to foster the emotional and cognitive growth toward a healthier functioning.

Current behaviorist programs do not acknowledge the importance of this task, nor do they provide appropriate experiences for its development nor establish the connection between its socio-emotional and its cognitive aspects.

These programs, by virtue of their teacher-centered emphasis (Safford, 1978; Reid, 1978a; Schmid-Kitsikis, 1976) and their characteristic external reinforcement, fail to provide adequate opportunities for developing an appreciation of another's perspective in relation to the child's own. Qualitative changes do not occur in acknowledging another's perspective from having particular responses reinforced, but rather from placing into juxtaposition his own responses and those of other children as well as authority figures (Forman and Kuschner, 1977; Furth, 1969).

Having the "correct" social rules or perspectives presented externally and typically via the teachers' authority does not encourage the kind of equilibration required to develop social autonomy or awareness of self and respect for others.

Role of Error. The way in which an educational model addresses error is crucial in determining the efficacy of its program. "The effectiveness of any teaching program critically hinges on the management of the wrong response" (Blank, 1973).

It has been the prevalent viewpoint among special educators, particularly those teaching disturbed children, that one great advantage of a behavior modification approach is its organization of curriculum sequences into simple, discrete increments which are intended to eliminate the opportunity for error (Harshman, 1969; O'Leary and O'Leary, 1972; Honig and Staddon, 1977).

Yet productive use can be made of error in at least three ways. It has significant potential for purposes of diagnosis, for aiding affective growth, and for stimulating cognitive development.

1. Diagnostic Use of Error. Because behaviorist programs minimize the occurence of error in their attempt to organize instructional programs sequentially in small incremental elements, the teacher has little opportunity to gain insight into a pupil's pattern of inquiry through a diagnosis of the kinds of mistakes that particular child makes. It is especially important to develop such insight in teaching disturbed children since their patterns of functioning are often erratic and quite different from

those of normal children, and their educational profiles tend to be irregular. The pedagogical thrust of behaviorism restricts the diagnostic use of error as a critical source of such insights.

This is not to say that in cases where the material is simple that errors should automatically be introduced or encouraged, but rather that many areas of the curriculum should contain broader, more complex tasks that do not lend themselves to successive approximations or small incremental steps.

More broadly conceived tasks of problem-solving allow a teacher to gain insight into a child's intellectual processes and strategies, and to plan more appropriate activities each day. The errors and mis-strategies that normally occur can be used as important diagnostic information to indicate how the child structures his picture of the world, the ways in which he would transfer this knowledge and the cognitive methods he brings to bear on the data.

2. Error and Affective Growth. In traditional systems, error was simply wrong; it was punished or extinguished, and in the process it was often the source of a child's shame and regret. In attempts to avoid this educationally unproductive use of error, behaviorist programs for disturbed children do tend to avoid these

aversive controls, but they employ equally narrow techniques. They exchanged aversive controls and punishment for positive reinforcement, but retained the narrow intellectual approach, adding smaller incremental steps in each process, leaving intact the externality of the reinforcement.

Trying and failing in school--or anywhere--has a profound impact on a child's view of himself. In order to build self-esteem in this area a program that simply avoids error misses significant opportunities for producing growth in disturbed children; it must instead develop strategies for comfortable risk-taking which may well lead to error.

Because of the often bizarre affective response that disturbed children may have to the experience of error, it is understandable that a behaviorist approach attempts to alleviate this reaction by minimizing the occurrence of error. The notion is that this gives the child a chance to experience successful participation and receive positive reinforcement in the classroom. While this is true, there is another side of the issue to be considered. Learning to accept the affective consequences of risk-taking behavior, and hence error, is a slow but vital process in the emotional growth of a disturbed child. The behaviorist approach, in reducing the occasion of error for short-term needs, does not deal with this critical longer-term need.

The issue of self-esteem is important in a behaviorist system. Yet the building of confidence tends to be founded on small successes and the avoidance of error. This does not encourage more broadly conceived intellectual tasks such as hypothesizing, making judgments, predictions and estimates, posing and solving problems, taking a critical view or imagining another's perspective--all of which might lead to error. To provide a safe environment for these tasks, to foster the gaining of satisfaction through such risk-taking, to feel comfortable with error and its ramifications are important elements in a program for disturbed children.

3. Error and Cognitive Development. If error is considered pernicious, or even simply unproductive, this certainly places a premium on success and correct responses. Current programs do not emphasize error: a) as interesting, provocative, and rich in possibility for insight into the child's own structuring of knowledge; b) as an interesting response which really answers another equally valuable question to be pursued at some other point; or c) as a mistaken departure which suddenly seems to signal a new and productive approach, or imparts insight into a new problem. They instead tend to sacrifice the richness of outcome to the safety of small, correct answers which do not generate anxiety.

Behaviorist programs, then, do not allow for, let alone encourage, the productive use of error for cognitive development. Even allowing error to occur is counter to behaviorist procedure. Consequently, disturbed children are not given a chance to see their errors as potentially fruitful, leading to a new direction, or giving a sudden new insight. This aspect of their education is important for these children for whom error and failure often signal the end rather than the beginning of a cognitive learning sequence.

In a behaviorist-oriented approach error, therefore, is clearly programmed out whenever possible (Harshman, 1969; Hewett, 1968; Honig and Stadlon, 1977; O'Leary and O'Leary, 1972). Yet the confrontation of error has certain implicit value which is by-passed in such programs. For instance, coming to terms with a wrong response often solidifies a right response, leads to the gradual internalization of the "rules" that are applicable and affords the child evaluative techniques which can be used independently of the teacher (Blank, 1973, pp. 88-89).

If not given the opportunity to coordinate his own incorrect view with another viewpoint, but instead experiences no chance for error or has an error immediately corrected by teacher or text, the child does not become practiced in the process of viewing his own mistakes in a

meaningful context. Kamii (1981) sees this process of the child's examining his own error in the context of its contradictions or inadequacies as crucial for both the narrow goals of remembering the correct answer as well as the broader goal of coming to trust his own thought processes. Children whose errors are handled in the behaviorist manner, Kamii maintains, will come to distrust their own thinking.

Another consequence of behaviorist "errorless learning" is that the children fail to learn what to ask on their own with respect to the problem and the materials involved. Nor are they learning to develop or test their own hypotheses. If one aspect of learning is "discovering what information is relevant to a particular problem, then learning to learn is learning to <u>discover</u> what information is relevant to a particular problem" (Forman and Kuschner, 1977, p. 110).

Basically, behaviorists fail to recognize that errors do not necessarily arise from the child's inaccurate perception of empirical phenomena, but often from the absence of an appropriate framework to incorporate or organize the perceived information (Schmid-Kitsikis, 1978, p. 359). Therefore, the behaviorist approach to error not only does not allow for appropriate diagnostic material to be gained, and does not use error productively with regard

to affective and cognitive growth; it fails to understand the significance and origin of error in certain contexts.

Role of Active Exploration and Inquiry. Programs designed for disturbed children underestimate the power of active exploration in cognitive development. "These children are more likely to perform exercises and drills rather than to explore their environment and to pursue their own interests. Drill, programmed learning and M-and-M's do not encourage reasoning. Exploration does" (Reid, 1978, p. 227).

There is a behaviorist tendency to view knowledge acquisition as the absorption and accumulation of infor-mation from the external world rather than as a process of construction. The attempt is made to impart information to the child, a passive receptor. The learner is seen as a receiver of predetermined products of a discipline rather than as an investigator of the structure underlying a discipline. Reid's observation further supports this description: "These practices assume a passive learner, a fixed body of knowledge and skills to be diagnosed and remediated, and fixed approaches to learning problems" (Reid, 1978, p. 227).

Active exploration is also important for emotionally disturbed children as a contribution to the acquisition or strengthening of personal identity. In current programs

children are not encouraged to formulate their own limits
and boundaries with respect to cognitive, social and
emotional parameters. Because of this passive role
assigned to the child in a behaviorist approach, he is not
often given the opportunity to set his own limits--
intellectually or socially. He therefore gets little
practice in constructing the borders of his identity.
Active decision-making is likely to aid in developing a
sturdier self-concept and particularly when those decisions
pertain to children's own limits. More of this would be
useful in a setting for disturbed children.

This absence of active exploration in behaviorist
programs is particularly reflected in the choice of curri-
culum materials. "The notion that special needs children
require stimulus-lean environments may have evolved as a
way of getting children to attend to highly evolved tasks
that are not developmentally appropriate" (Meisels, 1979,
p. 202), and moreover are not absorbing or motivating.
Cruickshank et al. (1962) describe this reduced-stimuli
environment for disturbed children as follows:

> Learning is conditioning; environmental stimuli
> should be reduced, as should the physical space;
> a structured school and life plan provided and
> the stimulus value of the materials designed to
> cope with the particular psychopathology and
> teaching directly to the disability.

This view indicates the severe limitations on exploration
characteristic of behavior modification systems.

It is this active involvement of the knower transforming objects in his environment that is often missing in behaviorist special education programs, and which could function as a powerful motivating force for disturbed children. This kind of interaction with the materials in the child's environment--this changing, preserving, reversing, rearranging, enhancing--is the basis of cognitive growth as viewed by certain critics of the behaviorist paradigm (Forman and Kuschner, 1977; Kamii, 1971; Furth and Wachs, 1975). Its underemphasis in current programs is seen by them as problematic.

C H A P T E R   V

CONSTRUCTIVISM: THE CONCEPTUAL

FRAMEWORK

Before elaborating a constructivist pedagogical
alternative to behavior modification it is necessary to
examine the conceptual foundations of constructivism.
Accordingly, the purpose of this chapter is to present a
brief outline of the main conceptual elements of construc-
tivism as developed by Piaget. This conceptual framework
will indicate the principal differences in orientation that
set this approach apart from that of Skinnerian behavior-
ists, and will also provide the conceptual bases for an
alternative pedagogy for emotionally disturbed children.

If behaviorism tends to be guided by a mechanistic,
unilinear metaphor that emphasizes the passive relationship
of the organism to an external environment, constructivism
is conceptually more biological and multidimensional,
bringing in dynamic interactions between a range of
physical, internal psychological and external social varia-
bles. Piaget's formulation can be viewed as a set of
orienting attitudes or concepts in which theoretical
elements have been drawn in large part from empirical
observations. In the Piagetian description of cognitive

development important formulations are based on the processes of adaptation and their relation to psychological organization, with emphasis on the principle of active construction and dynamic equilibration.

Piaget's epistemological perspective provides the overarching framework for his formulation of constructivism, and hence it is well to begin with this. The notion of active construction is a basic guiding principle that permeates other components of constructivist theory and should be clarified next. Of the four factors--maturation, experience, social transmission and equilibration--which in Piaget's view, most significantly influence cognitive development, the fourth factor, equilibration, is the most unique contribution and the one that is critical in pulling the other three together. Since the overall function of the equilibration process is seen as adaptation, a description of this principle follows rather than precedes the discussion of causal factors in cognitive development.

A summary of the Piagetian conception of the stages of cognitive development is presented at the end of the chapter. These stages, considered by Piaget to be invariant, are perhaps the best known feature of his conceptual framework. While they are often used as a point of departure by students and practitioners, it is contended here that using this as the total reference point diminishes,

if not distorts, the potential significance of the richness
of Piagetian thought. Consequently, prior attention is
given to the foundations of Piaget's conceptual framework
as a more productive point of reference than the stages
per se.

General Epistemological Perspective

Historically, classical epistemology was the province
of speculative philosophy, with little in the way of
empirical study to support any given position. Piaget
(1971) criticized the use of speculative methods with
respect to epistemological questions and advocated the
study of children's actual cognitive development to
determine the nature of knowledge and the process by which
it is acquired.

His self-appointed task, as an epistemologist, has
been to apply observational techniques to child behavior
and extract data from those observations on which to base
his theory. He describes his endeavor as genetic epistemo-
logy (Piaget, 1970, 1976).

This epistemological viewpoint incoporates elements
of both Humean empiricism and Kantian rationalism. Piaget
stresses experience but not human passivity in relation
to it. He also stresses human organization patterns in
thought as giving meaning to experience and even shaping
perception. From Piaget's perspective, the rationalists

and the empiricists failed to see that each was emphasizing only half of what is an integrated interactive process, a cycle of dynamic and reciprocal influence.

Piaget rejects as separate alternatives both the empiricist and the nativist approaches. He rejects the nativist, preformed, innate categories of knowing into which sensory stimulation is channeled, as well as the empiricist consideration of the developing organism as completely subject to environmental contingencies. Development in the first instance is then merely innate maturational activation; in the second instance knowledge is but a subjective copy of the external world. Both are untenable according to Piaget who instead views knowledge as sets of dynamic relations (Furth, 1969; Forman, 1980).

Objections were raised by Piaget to the reductive atomism found in both modern behaviorism as well as in classical empiricism. These disciplines have attempted to explain patterns of intelligent adult behavior in the same terms as the infant or lower animals; higher, more complex forms are then viewed simply as incremental additions of homogeneous elements. Piaget's developmental view sharply contrasts in its emphasis on different forms of organization at different levels and on structures that are inexplicable as mere additions of homogeneous elements (Mischel, 1979).

The theory is interactionist in that he emphasizes

the dynamic interrelationship of subject and object, of knower and known. It is constructivist in that the process of coming to know is viewed as an active construction originating in internal structures and organizational abilities from within the knower.

Principle of Active Construction

Piaget differs from Skinner in some very basic, elemental ways, one of which is his assumption of an active organism as opposed to Skinner's view of an essentially passive organism. He sees this active element in the very beginning of child development, with an infant who controls in some sense the procuring and organizing of his own outside experience. At first the activities that organize patterns of resulting experiences are physical, directed toward objects and events in the environment. The scope of possibilities expands as the child grows and his range of exploration continues to increase.

At a later point in this developmental process, these external activities also develop an increasingly significant inward dimension and include symbolic and more sophisticated use of language to represent actions and operations on objects and ideas. In fact, for Piaget, thought is essentially interiorized action in an effort toward internal organization and growth.

> Understanding the dynamic quality of trans-
> formations . . . is dependent on activity, at
> first actual, then internalized and finally
> reversible. . . . The child must act on objects
> and transform them in order to comprehend their
> nature (Reid, 1978, p. 205).

Thought, then, may eventually proceed almost entirely
without direct reference to physical actions in the
environment, although its origins are deeply rooted in
such action. Instead, the older child or adolescent is
capable of representing mentally the physical world and
proceeding by means of memories, imagery, language and
symbols.

While Skinner focuses exclusively on behavior, Piaget
views the same behavior as not merely a response to the
external stimulation of the environment. He also sees in
the reaction of the organism evidence of its underlying
structural aspects. From this biological perspective, the
stimulus is not viewed as fully formed, separate and
external to the organism and only acting upon it.

In the Piagetian position, all levels of behavior
indicate aspects of construction deriving at least
partially from the organism's intrinsic structure. This
structuring aspect is identical with meaningful, knowing
behavior. "To know is therefore an activity of the
subject and knowledge is a construction in the true sense
of the term" (Furth, 1969, p. 15).

Piaget rejects the demarcation between perception and

abstraction, maintaining that even rudimentary perceptual
information is gained as a result of constructive activity
of the organism interacting with sensory data. Knowledge,
for Piaget, is never a state, whether subjective, repre-
sentative or objective; it is never static but always
dynamic. It is an activity. Knowledge can be viewed as
"a structuring of the environment according to underlying
subjective structures or as a structuring of the subject
in living interaction with the environment" (Furth, 1969,
p. 20).

Four Factors in Cognitive Development

Piaget's articulation of four factors responsible for
cognitive development is central to his theory. According-
ly, the following section presents a close, if condensed,
look at these factors as a composite drawn from primary and
secondary sources (Piaget, 1970; Gallagher and Reid, 1981;
Furth, 1969; Pulaski, 1980; Wyne and O'Connor, 1979). In
the Piagetian conception, then, cognitive development is
the result of the interaction of four essential factors:
(a) physiological maturation, (b) experience, (c) social
transmission, and (d) equilibration.

Maturation is seen as a necessary but insufficient
condition to explain cognitive growth. This is not a
maturational theory; development does not simply unfold.
So while Piaget acknowledges maturation as a factor, it is

not highly emphasized in his theory.

Experience is divided by Piaget into three major areas: exercise, physical experience and logico-mathematical experience. The first refers to those actions which do not lead to new knowledge. The second refers to the manipulation of objects that leads to the discovery of properties; it is the action of noticing the positive characteristics of objects which Piaget calls affirmations. He describes the process as one of empirical abstraction, indicating his belief that properties do not impose themselves on a passive mind, but rather the knower abstracts them from the objects.

The third kind of experience is emphasized in Piaget's theory and is rarely mentioned in other theories. It too is gained from one's own activity with objects but indirectly so, by reflecting on those activities, drawing out inferences and relationships, developing logical rules that are applicable to any objects. This process Piaget describes as reflexive abstraction. Although it too is originally bound up with knowledge drawn from acting on objects, it is not dependent on the continuation of that activity upon the objects themselves, but eventually becomes content-free. Knowing that the sum of objects counted is independent of their order, for example, is originally based on counting and arranging a set of objects, but the logical

rule drawn from that process gradually becomes independent of those or any objects.

While physical knowledge is gained through affirmation as described above, logico-mathematical knowledge is gained through the construction of negations or the understanding of nonproperties of objects, e.g., a red ball is not square and not blue. Thus, it is sufficient in physical knowledge to affirm the positive aspects of objects as in empirical abstraction; in reflexive abstraction it is necessary also to exclude logically properties that do not obtain.

These kinds of activity/knowledge relate also to Piaget's notion of the figurative/operative distinction. Figurative refers to the knowledge of states or configurations of reality as gained through perception or imitation. Operative refers to cognitive functions required to understand transformations; operations are described as internalized mental actions.

Figurative knowledge depends on recognition of the configuration of the stimulus, while operative knowledge involves inference-making at some level. There is a general progression toward the use of operative knowledge in a child's development, de-emphasizing the earlier predominance of the figurative aspects of knowing (Forman, 1980b).

The interrelationship of empirical and reflexive

abstraction, of figurative and operative knowing is of
central importance in Piaget's view of cognitive develop-
ment. The common element is activity, which provides the
foundations for both perceptions and concepts. Knowledge,
then, for Piaget, unlike Skinner, is not a process of
copying reality, but is founded on the knower's actions
upon objects to transform them and the connected activity
of thinking about the outcome.

Social Transmission is the third factor in explaining
cognitive development. It is gained through social and
cultural interaction, through the development of social
relationships and through the use of language and communi-
cation between individuals. The impact of social inter-
action is strongly felt by children. There is a certain
intensive exchange of ideas in a group of children--in
terms of what is noticed, what is selected for focus, and
especially in terms of recognizing other perspectives and
incorporating the disagreement or disequilibrium in some
way.

The importance of social activity within this system
is clearly illustrated in the following statement: "Without
interchange of thought and co-operation with others the
individual would never come to group his operations into
a coherent whole" (Piaget, 1967, p. 163). The emphasis
here is on active social involvement just as it is with

respect to active involvement with objects. A child's passive presence in a group will not necessarily assist in the coordinations of mental actions just as passive recognition of objects will not yield any understanding of relations between those objects or between the objects and the observer.

This view of social interaction is a dynamic one, implying active contribution to the working group and active involvement in the shifts and balances that occur within it. "Such a system of human relationships replicates the properties of mental operations. It allows the child to become, himself, an action within a co-ordinated system of actions" (Richmond, 1970, p. 95).

Social interaction is one method that is especially effective in promoting decentering--a relinquishing of egocentrism. It reveals the perspectives of others and suggests that the child's own view is not the only possible choice. This typically leads children into conflict and into justifying and clarifying their views. Such clarification has both affective and cognitive components. Affectively, it suggests agreeing on a group issue, without socially inappropriate behavior and coming to terms with opposing views and with the feelings of others. Cognitively, it suggests making one's ideas clear and persuasive in order to convince with rationality on one's side.

Equilibration is the fourth factor responsible for cognitive development; it is a final one that pulls together and coordinates the other three and renders them effective in promoting development. In Piaget's view, none of the other three alone or in combination can account for cognitive growth. Equilibration is proposed as a dynamic, ongoing and self-regulating process which "acts as a motivating force between the increasing competence of the child (maturation) and his growing range of interactions with objects and people (physical and social experience)" (Pulaski, 1980, p. 192).

This factor of equilibration is thought by Piaget to structure internally and organize the developing intelligence, providing the self-regulation through adaptation to external and internal changes. It is a unifying principle invoked to explain the impelling force in cognitive growth. Invoking it does not mean that Piaget reduces the importance of the external experience. On the contrary, Piaget sees environmental factors as the medium in which intelligence functions and with which it interacts.

Particularly through this concept of equilibration, Piaget demonstrates the biological emphasis of his theory. His view of intelligence is based on this dynamic notion that brings order, lawfulness, purpose and structure into behavior.

The term equilibration is used to refer to the process of self-correction or self-regulation because it leads to increasingly advanced states of equilibrium within the cognitive system. Its purpose is to eliminate contradictions and the conflict between expectation and outcome. Central to the development of Piaget's genetic epistemology, equilibration illustrates the reciprocal nature of the relationship between knower and known. It functions to reorganize on a higher level what is learned from co-ordinating the knower's own activity in the construction of rules and principles.

> Equilibration is the essence of adaptive functioning which for Piaget is constant at all levels of development, even though the states of equilibrium characteristic of each level or stage differ qualitatively from one stage to the next (Pulaski, 1980, p. 14).

Principle of Adaptation

Adaptation is the overall aim of the equilibration process. It is a central concept in Piagetian thought and is the essence of the biological functioning of all species. It is a dynamic force, cyclically moving between its components--assimilation and accommodation. Assimilation is the process by which experiences, ideas, sensations, or nourishment are taken in and incorporated into the organism's own activity. This process is continuously balanced by accommodation in which the organism is in an outgoing

mode, adjusting to the impact of the environment. In
Piaget's view, it is the dynamic interaction between these
two elements that makes possible both physical and cognitive
development.

The assimilation-accommodation balance is seen as a
continuous fitting of old structures into new functions and
the concommitant changing of new structures to suit old
functions under changed conditions. The developmental
process, then, originates from what already exists,
demonstrating a continuity with the past. Simultaneously,
current structures change in response to new demands.

Adaptation is basically a concept, having its origins
in the discipline of biology from which Piaget extrapolated
it, and applied it to human development. His procedure has
been to describe structures functioning at each age level,
demonstrate the ways they adapt to one another and to
environmental demands, and how these structures simultane-
ously modify what the environment demands.

An important application of this biological frame of
reference can be seen in Piaget's use of "schema." It is
of interest to consider this term in contrast to the
behaviorist "response." Schema may be simple or highly
differentiated. In its simplest form it may be similar to
"response." However, it is usually more complicated than
"response," in that "the schema generally includes a

variety of acts in many different circumstances, not just
a response to a specific stimulus," and also is more
mobile, being amenable to application to a variety of
objects (Baldwin, 1967, p. 174).

"Schema" is used not only for overt actions,
classified within the sensorimotor stage, but also for more
complex cognitive functioning or interiorized action.
Piaget believes that the latter derive from the former via
a process of internalization. The visual image, for
example, evolves from the action of looking. Development
is partly explained in terms of the intricate evolution of
simple, primitive schemas into broader, more operational
systems.

The dynamic force of development can be seen at work
in Piaget's notion of assimilative schemas. In a given
situation, certain aspects are assimilable but not
completely assimilated and therefore evoke a schema,
motivate its use until the situation has been mastered.
As a result, the schema becomes a usable tool, but the
activity having been mastered no longer is attractive or
motivating. Perhaps a novel feature of the situation will
capture the child's attention until some equilibrium is
reached again. In this fashion there is a broader range
of situations covered, and a greater array of organized
systematic schemas results (Baldwin, 1976, p. 177).

The accommodation process accounts for the necessary modifications in those assimilation schemas. Thus, assimilation and accommodation are complementary and occur simultaneously, balancing each other to insure adaptation. Adaptation is closely connected to the organization of the organism. In the process of organizing his activities, the individual assimilates novel events and simultaneously accommodates existing structures to meet new demands of the environment. As a result of these tendencies toward organization and adaptation, new structures are continually in a process of construction in the interaction with the environment.

Stages of Cognitive Development

Genetic epistemology divides cognitive development into four stages: (a) sensorimotor stage (1-1½ years) in which coordination of action is emphasized; (b) pre-operational, or representational, stage (2-6 years) in which internalization of actions begins; (c) concrete-operational stage (6-11 years) in which reversible operations and relations among objects are characteristic; and (d) formal-operational stage (11 or 12-adult) in which relations between relations are typical.

In the first stage, the child progresses from limited reflex action through the rudimentary beginnings of mental representation as demonstrated in the gaining of

object permanence. There is initially an egocentric lack
of differentiation between the infant and objects in the
environment. The gradually achieved ability to comprehend
the permanence of objects--both physical objects and
significant people--is the supreme achievement of this
stage.

The object, according to Piaget, involves more than
the child's perception of it as occupying space in the
external environment and possessing specific describable
properties. In order to comprehend the object in even the
most rudimentary fashion, the child must come to know it
as separate from himself and as independently existing.
This task represents the first crucial step away from the
extreme egocentricity of infancy.

The preoperational, second stage is characterized
by symbol formation, beginnings of language comprehension,
and mental representation. The child at this stage is not
yet able to use these symbols to operate logically on the
environment, but he has gone beyond the sensorimotor stage
in knowing that some changes do not make a difference, why
they do not and how to express this knowledge in language.
This period reflects a time of increasing fluency with a
variety of symbols, which aid in going beyond the informa-
tion perceived in the immediate present.

Concomitant with the inability to operate logically

is the continuation of some form of egocentric functioning,
namely the inability to see another's perspective--cogni-
tively and socially. The preoperational child truly
believes everyone views the world as he does, his own
perspective is assumed to be objectively true and absolute.
What exists for him in dreams or imagination exists equally
for anyone else. He infuses the world with animistic and
magical thinking, viewing his environment as alive and
purposeful as he himself is.

The preoperational child maintains a narrow, rigid
and egocentric perspective, unable to focus his attention
beyond the immediate configurations or separate states,
unable to focus on transformations between separate states.
Predominant in his cognitive functioning is what Piaget
calls the figurative aspect of thought, focused on the
perceptual elements of objects. Yet, with all of these
developmental limitations acknowledged, it is important
to note that at the end of this stage the child is typically
moving toward the more systematic, logical thought as
revealed, for example, in the ability to conceive and to
handle class inclusion or seriation problems.

The third stage, concrete operations, is a period in
which the child develops the ability to think deductively--
a form of abstract thinking--although such deductions are
limited in scope and range, based on witnessed events.

The thinking characteristic of this period is, then, deductive, but the content of thought is real objects rather than other deductions (Forman, 1980b). It is the beginning of organizing thoughts into coherent structures and arranging them in various relations.

The fourth cognitive stage is called the formal operational period and is characterized by logical operations no longer directly or necessarily bound to objects. Operations become the content of thinking. The child can think about thought, reflect on ideas as well as think about concrete objects. He is able to formulate and comprehend general laws or principles which underlie particular instances, deal with purely hypothetical concepts, entertain logically notions which my be physically impossible. Piaget describes this sophisticated level as hypothetico-deductive thinking.

These limits of cognitive development represent successive stages, each of which builds on its predecessor. The achievements of earlier stages are not discarded in favor of newer, more sophisticated versions; rather, those achievements are incorporated, restructured and reorganized to form more advanced complex forms of functioning. Piaget views the child's cognitive development as a continuous, connected and consistent progression, spiralling toward formal operational thought, with patterns from each stage

being successively reorganized and incorporated into the
next.

These stages of cognitive development clearly
represent an important contribution to the field. But,
as indicated at the beginning of the chapter, it is a
mistake to focus on them as a point of departure in
dealing with Piagetian concepts. This misplaced emphasis
has in fact been problematic in many American applications
of Piaget and has often led to misguided attempts to
accelerate development. The epistemology, the principles
and factors in cognitive development, not only the stages,
are central to his thought. They are also the most
productive reference points for discussing pedagogical
implications and applications, which is the next task of
this study.

C H A P T E R   V I

PEDAGOGY OF CONSTRUCTIVISM: IMPLICATIONS FOR
LEARNING NEEDS OF THE EMOTIONALLY DISTURBED

Building upon the conceptual framework of the
constructivist approach, what are its pedagogical impli-
cations for dealing with learning needs of emotionally
disturbed children? This chapter begins with a general
resume of the relevance of the constructivist perspective
to the particular characteristics and learning needs of
the emotionally disturbed. It then examines more speci-
fically how this approach would deal differently with the
four critical areas previously identified and used as
reference points in the critique of behaviorist pedagogy
(Chapter IV). The chapter and study concludes with an
indication of some areas that need further study and
development if the constructivist alternative is to be
employed more extensively and effectively in the education
of emotionally disturbed children.

Relevance of Constructivism for the Education
of the Emotionally Disturbed

As indicated earlier in this study, a behaviorist
approach to the education of emotionally disturbed children
may be considered appropriate for dealing with certain

short-term educational needs and superficial manifestations
of this disorder. Indeed, it is the limited, immediate
and concrete quality of the approach that has contributed
to its appeal and widespread use in educational programs
for this group. But in many important respects the
behavior modification approach, in dealing with external
symptomatic behavior, converges with, rather than corrects,
predispositions of the emotionally disturbed. It does not
touch the variety, and complex interaction, of variables
that lie at the root of the disturbance. Consequently, it
does not represent a viable approach for serving interme-
diate and longer term needs that must be met if more
thorough and sustained growth is to be achieved.

The contribution of the constructivist alternative
is that it provides a lens for recognizing the nature and
interactive relationship of significant variables--the
affective, cognitive, social and psycho-motor. It thus
represents a more sound basis for diagnosis, a more
complete frame of reference for prescriptive action.

The relevance of the constructivist perspective for
the education of the emotionally disturbed may be summarized
by relating components of its conceptual framework, dis-
cussed in Chapter V, to selected characteristics of
emotionally disturbed children described in Chapter IV.

A constructivist view of educational priorities for

disturbed children focuses on developing intrinsic
motivational patterns and excluding as much as possible
external reinforcement strategies in more complex learning
situations. There is emphasis on the child's taking more
responsibility for his own processes of inquiry and
consequently increasing his intrinsic motivation and his
striving for independence and competence. In de-emphasizing
external motivation, the constructivists minimize the
problems of maintaining interest, of transferring learning,
and of transition from dependence on reinforcer or external
authority.

Dewey corroborates the point stressed in this
approach:

> If the subject matter grows out of the child's
> own past doings, thinkings, and sufferings, and
> grows into applications in further achievements
> and receptivities, then no device or trick of
> method has to be resorted to in order to enlist
> 'interest' (Dewey, 1902, p. 27).

Piagetians would draw out the child's interests in similar
ways and begin the curriculum spiral that employs an idea
or problem at sequentially different levels, each time
seeking higher order thought process.

This approach focuses on broader intellectual issues
and avoids presenting these in small increments. Instead
the child is given whole patterns to deal with or is
encouraged to break tasks down for himself as part of an
active construction. It avoids a narrow, figurative

emphasis which would focus on simple properties in favor
of fostering inference, prediction, analysis, and in
general a pattern of reflective thinking. In so doing,
this position assists the children in developing frustration
tolerance which is crucial in their battle with impulsive
responses. More complex cognitive experiences are likely
to lead eventually to delayed responses, a habit of thought
that can then influence the ways in which these children
approach other social and cognitive problems.

The static modes of thinking and learning character-
istic of emotionally disturbed children are treated by the
constructivists as idiosyncratic but not categorically
different from earlier levels of development. According
to this approach, these children are capable of progressing
to more operative forms of thought and the active curriculum
is designed in part to alter their static focus. Emphasis
is always on the transformational character of object
relations and events. This affords the opportunity for the
children to escape the circular pattern which moves from
static focus to passive involvement to lack of inquiry
skills or methods to solidifying the overall functional
pattern. Constructivists hope to break the circle, inter-
jecting active methods and consequently more internalized
motivation and greater self-confidence for the children in
their own abilities to transform and to comprehend.

The overaccommodative reality-distorting aspects to the pathology of this group, their difficulties with object-permanence, symbol-referent confusion and perspective-taking are addressed by the constructivists partly through the use of active methods of inquiry and partly through emphasis on developing autonomy. The self-regulatory, autonomous character of the knower in acquiring knowledge is a sought-after quality in the development of these children.

The educational strategies to accomplish changes in their overaccommodation include encouraging them to make changes in their environment, to manipulate objects, to alter them so that the children experience a sense of appropriate power and will feel less compelled to distort reality as a protective device. These same strategies foster a stronger sense of self as distinct from others and the outside world, allowing appropriate boundaries and consequently moving toward a more autonomous stance.

Other prominent features of disturbed children's educational patterns are avoidance of conflict, functional confusion between symbols and referents, a general egocentric perspective and a characteristic impulsivity. Constructivists view these as intricately interwoven aspects of cognitive, emotional and social functioning and recommend a curriculum which confronts these problems in

terms of providing active involvement in social and
cognitive decentering or perspective-taking tasks,
practice in determining some of their own social
boundaries and limitations, and participating intensely
in a social context designed to elicit stronger self-
concepts.

An important element brought to bear in this
approach is the teacher's emphasis on knowledge about the
child, about the ways he typically constructs knowledge
at given levels, about the idiosyncratic ways in which
the disturbed child carries out similar tasks.

Dewey's (1902) concern over the fractionalizing of
curriculum into discrete and separate disciplines, bounded
by class-time and textbook, is shared by Piagetian
constructivists. The universe is fluid and fluent,
according to Dewey and a traditional curriculum fails to
reflect this fluidity. Piagetian educators attempt to
meet the disturbed child's fractionalized, fragmented view
of the world with a curriculum based on principles of
continuity and connection.

These recommendations from constructivists are
representative of their general approach and indicative of
the way education for disturbed children is organized
within such a system. The following section, devoted to
discussion of the four critical areas, deals in more detail

with the educational implications of the constructivist
position.

Implications in Four Critical Areas

Earlier in this study the behaviorist approach was
criticized partially in reference to its adequacy as a
pedagogical guide for handling four areas: emotional/
cognitive conflict; intellectual, social and emotional
autonomy; the role of error; and the role of active
inquiry. The relative merits of the constructivist
approach have been implicitly or explicitly indicated in
this critique, as well as in subsequent discussion of
constructivist concepts. Here the intent is to summarize
the distinctive constructivist orientation, and discuss its
pedagogical implications, in each area.

Emotional/Cognitive Conflict

> . . . Changes take place by virtue of
> conflict. . . . Development . . . consists in
> the production of contradictions as much as
> in their resolution (Hass, 1977).

Disturbed children, as described earlier in this
study, typically experience intense and chronic emotional
conflict. The inadequate treatment of behaviorist programs
with regard to this issue was also delineated. The con-
structivist approach to this pernicious and pervasive aspect
of the children's functioning takes a totally different

direction. Instead of extinguishing the behavior indicating such conflict, constructivists attempt to provide real and manageable contexts in which to encounter a cognitive version of conflict. This is educationally planned, elicited conflict; it is induced by the environmental situations designed by educators for this purpose.

While conflict and tension in the raw emotional versions bring about anxiety and discomfort for these children, cognitive conflict plays a central role in intellectual growth. It addresses indirectly the intensity of their chronic emotional conflict; its use in an educational program provides the children with necessary experience and consequent strategies that lead to better resolutions in the cognitive area--a process which might parallel the management of emotional conflict as well.

Academic tasks carry with them a modicum of emotional distance which can be used to introduce these children to conflict in a non-threatening way. It is easier for them to handle an intellectual dilemma than a social or intense emotional one, particularly if it is carefully introduced and actually elicited by a curriculum plan. This arena provides an opportunity for children to practice their intellectual coping strategies. Such experience can be slowly increased within the curriculum and could eventually serve as a means of transferring coping mechanisms to

experience in daily living as well. There is then an on-going spiral of confidence in intellectual areas contributing to social/emotional competence, which in turn enables them to attempt more intellectual encounters with cognitive dilemmas.

Not only in terms of their specific needs as disturbed children, but also in more general terms of intellectual development, it seems necessary to experience a certain amount of cognitive conflict.

> What is presented to the child should match his present cognitive structures and should challenge him in the sense of providing optimal conflict so that through accommodation and assimilation, cognitive restructuring can take place with consequent development of the cognitive structures (McNally, 1973, p. 94).

This conflict-inducing strategy can be descriptively sketched as follows. The teacher places himself near the children as they actively work out the solution to a given or self-imposed problem. If the children have worked out an intermediate solution, taking only some data into consideration, the teacher will then introduce a contrasting object or an idea or material that conflicts with the current solution, giving the children the opportunity to incorporate the conflicting data, but at the same time offers no correction of their formulation. This introduces a paradox in which what was expected did not occur but rather there was a transformation or

variation of the expectation (Forman and Hill, 1981, p. 33).

Such a conflict-inducing procedure presupposes, of course, appropriate prior curriculum decisions. Classroom tasks ideally are derived from the children's own experience, as authentic problems arising from experiences with interesting data found within the classroom. A teacher has the option of introducing problems although this is most effectively accomplished as a result of prior observation of the child's interests, strategies, levels of cognitive and social functioning and previous patterns demonstrated on other tasks.

The teacher must be able to ask puzzling questions which evoke conflict or contradiction, which in turn evoke the need for another perspective or the need to reexamine an overlooked aspect. He must be able to structure those questions on the spot while observing the child's particular perplexities and insights.

A specific suggestion to evoke conflict and to help teachers convey the continuum-like place occupied by opposites and thereby have children more easily recognize their transformational nature is made by Forman and Hill. Options should be provided not just in pairs, each with its diametrec opposite, but linked with at least one other middle choice. "The middle choice is often used to

generate the conflict necessary to reconcile the opposites, like the boy who realized he could not call the middle sized doll either tall or short, so he called it a little tall" (Forman and Hill, 1981, p. 40). This kind of strategy would make the conflict definitely experienced but probably manageable for a disturbed child.

Constructivists, in stressing conflict-inducement as a positive curriculum strategy, address the issue described earlier of the disturbed child's own experience of emotional conflict. Providing an educational dimension of managing conflict is likely to produce better strategies with which they can come to terms with their emotional conflict.

This approach affords opportunities for the child to resolve conflict and for him to reflect on that resolution process--both activities are important in transferring what is learned to the area of emotional conflict. It is an extrapolation from a specific cognitive event to a more generalizable affective awareness. The interaction of cognitive and affective elements has been delineated in several contexts earlier in this study. Its importance is noted once again with reference to conflict. Gains achieved in one context are felt in the other and promote some change there too. The process takes on a spiralling motion affecting the child's overall patterns of relating

to cognitive or emotional conflicts.

The constructivist's way of addressing this two-sided issue has the distinct advantage of dealing actively with the emotional conflict. This is in contrast to the behaviorist approach, presented earlier, which treats the symptoms of the conflict with the simplistic hope of eliminating their mainfestations through appropriate reinforcement. Constructivists are attempting to aid the child in restructuring his relationship to conflict, to put him more in control of its pervasive effects and not merely to gloss over its superficial aspects.

This procedure has another advantage over a behaviorist method. Instead of focusing on past reinforcements, the child is encouraged to predict consequences in a future oriented way. It leads attention away from factual memory and toward the anticipation of results--a more productive strategy for disturbed children who, as we have seen, tend to fix on static aspects and focus on current states without looking forward or thinking predictively. Such prediction with respect to conflict-inducing situations is important in any context of the curriculum.

A third advantage of promoting cognitive conflict has to do with the child's actively owning the answer he finally provides, as opposed to the passive acceptance of the "right" answer, suggested by the authority of the teacher

or text, appropriately reinforced in a behaviorist system.

The concept of learning for the constructivist includes knowing that one event is a variation on a previously known theme as well as how that is the case. It is a process of knowing why irrelevant stimuli are in fact irrelevant and how those selected fit into a previous cognitive framework. This kind of data is best drawn from active participation in a curriculum designed to elicit independent responses to planned cognitive conflict.

Piagetians applying the theory in classroom settings deliberately plan for induced conflict as a response to materials, experiences, questions or problems posed for the children (Inhelder, Sinclair and Bovet, 1974; Case, 1976). These approaches are organized in ways designed to elicit cognitive conflict as part of a continuing, planned process of inquiry. They are not linear programs with specific responses expected. Rather, they have open possibilities of resolution, but the conflict is a built-in feature. This is important for disturbed children even though its use may require additional emotional support in the initial use. This would be necessary until these children were accustomed to this new model of inquiry.

Duckworth (1979) suggests that this feature of conflict should be evident in a rich problem-eliciting/ problem solving environment which, in her view, is more

important than attempts at matching specific curriculum
tasks to specific levels of each child.

Autonomy

> It is by exercising his ability to govern his
> own beliefs and actions that the child gradu-
> ally constructs internally coherent knowledge,
> morality, and personality (DeVries, 1978, p.
> 88).

The development of autonomy is comprised of two
separate but highly integrated aspects: social and cogni-
tive. Each has a significant impact on growth, with
reciprocal influence of each exerted upon the other.

The development of social autonomy is a complex
process rendered more so because of the complications of
social relationships as experienced by disturbed children.
It begins with an egocentric view of the world and ideally
progresses beyond this stage. It is one aspect of social
development within a general context of social interaction.

Social interaction, and indeed the entire realm of
social functioning is, for Piaget, a fertile ground for
restructuring the early egocentric patterns of children.
Disturbed children, particularly, experience grave problems
with this development and the deficiency in this context
further contributes to regressed functioning in other
social and cognitive areas.

The primary mode in which this problem is demonstrated
relates to seeing the perspective of another individual, or

rather disturbed children's failure to do so. It is relevant in both its social dimension, i.e., seeing an event or problem as another person sees it, and in its more cognitive dimension, i.e., visually representing an object or event as rotated in space as if viewed from another standpoint. These are interconnected abilities and difficulty with these for disturbed children seems often to be followed by difficulty progressing into more complex facets of thinking.

For this reason, it is important to focus on the possible ways in which to address this issue in educating disturbed children. In order to do this it is important to begin with the initial view of the self that is to be distinguished from others in this developmental ability and to consider how constructivists address this in contrast to behaviorists.

A constructivist view emphasizes the relationship between the individual and his environment or social frame of reference, and defines this relationship as completely reciprocal, dialectical and interactive. A human being as an active subject determines the world and the environment; at the same time he is being determined by that world. According to this perspective, self and society are inextricably woven together, maintaining, changing, restructuring one another in an interconnected fashion.

The self, then, is not passively determined by the social order, but rather is actively responding to the social order in which it functions; it derives its form from that dynamic interaction.

In contrast, according to Skinner, self-concepts which are based on a feeling of autonomy are culturally fostered illusions. The appropriate meaning assigned is expressed by Skinner in the following statement:

> A self is a repertoire of behavior appropriate to a given set of contingencies, and a substantial part of the conditions to which a person is exposed may play a dominant role. The identity conferred upon a self arises from the contingencies responsible for the behavior (Skinner, 1971).

According to this view, the only type of self-awareness that is not illusory involves the individual's ability to discriminate the operant properties of his own behavior which serve as sources of control for himself and social others.

Given these contrasting views of the self in relation to its environment, it is predictable that the constructivist view would address the developing of perspective-taking, with differentiation of self from other and with the educational implications of these issues as a major thrust in changing the functional patterns of disturbed children. The behaviorist tends instead to treat particular behaviors in particular instances without reference to such underlying

development.

Perspective-taking can be seen as a tool, a device of thought that helps to decenter a child's view and to orient him toward a more logical frame of reference, aiming for the kind of thought shared in a community of inquirers. "We must strive to lead the child to construct for himself the tools that will transform him from the inside--that is, in a real sense and not only on the surface" (Piaget, 1973).

Egocentricity is characteristic of early child development. Differentiation between self and other, self and objects, self and events occurs only gradually. It is a slow and difficult process for all children and depends a great deal upon the quality and intensity of the child's experiences and the patterns of interaction between himself and significant others in his world. It is a far more difficult and complicated process in disturbed children whose self-other differentiation is typically inadequate (Cowan, 1978; Schmid-Kitisikis, 1976; Reid, 1978a, 1978b).

These children characteristically exhibit a functional repertoire of limited decentering abilities and a fusion with persons, events and objects surrounding them. Because the fusion and confusion often render the distinction between self and other quite blurred, such children experience great difficulty in moving away from

egocentric patterns of viewing the world. In a developmental context, the ability to decenter, to take the role or perspective of another, is seen as a special case of a more fundamental capacity to departicularize the focus of conceptual activities and learn to consider and coordinate simultaneously two or more points of view (Langer, 1969).

Because of their affective and/or cognitive developmental delays, disturbed children tend to remain at this level of egocentrism, in a state of recurrent subject-object confusion which operates to confine an individual to a singular and highly personalized point of view while denying to others the uniqueness of their own vantage (Chandler, 1977). They fail to progress from that phase which Piaget describes as heteronomy--being governed from without; the attainment of autonomy--internal governing of oneself does not develop properly if at all. What they fail to accomplish is: (a) a mode of functioning characterized by independence and self-reliance as well as (b) an increasing comprehension of other points of view, of notions of fairness, justice and equality. Anthony (1956, 1970) corroborates this in his research:

> Under pathological conditions such [autonomous] development might fail to occur with the result that the child remains an undifferentiated, heteronomous individual, highly dependent on external authority for his attitudes and behavior (Anthony, 1970, p. 731).

For educational and diagnostic purposes, assessment

procedures have been developed to measure a child's ability to decenter. These strategies require subjects to describe objects or events from multiple points of view while maintaining a single position. The tests have focused on both visual perspective and social and inter-personal contexts. Severely disturbed children have demonstrated highly significant deficits in identifying objects depicted from other viewpoints, in adopting different social roles and in acknowledging another individual's personal viewpoint (Neale, 1966; Chandler, 1973; Chandler et al., 1974). Anthony (1956) found that disturbed children demonstrated significant egocentricism in both interpersonal and impersonal contexts.

The implications tend to be maintained throughout different types of situations (Feffer, 1959; Feffer and Gourevitch, 1960, Feffer and Suchotliff, 1966). Disturbed children tend to have difficulty decentering or developing role-taking abilities in all contexts. This nonegocentric form of thought, as Piaget (1970) views it, is not simply synonymous with accurate social judgment but refers instead to the ability to anticipate another's possible view, precisely when they differ from one's own.

It is this ability to anticipate other views that has far reaching implications for social and cognitive development. Socially, it is the beginning of empathy,

which is crucial in satisfactory interpersonal relation-
ships. Cognitively, it is the beginning of a more
objective, non-egobound view of the world, of inquiry
unfettered by one's own subjective preferences and views.
Feffer (1970) argues that because decentering is a crucial
element in the developmental structuring of experience, the
inability of a disturbed child to accomplish this task
contributes significantly to his pathology and his retarded
development in both social and cognitive areas of function-
ing.

"Various impersonal cognitive problems, such as
conservation of liquids and more interpersonal problems,
such as the coordination of multiple points of view, are
regarded as formally similar" to the perspective-taking
skills (Chandler, 1977, p. 117). The basic skill involved
is simultaneously considering and coordinating multiple
dimensions--a task which can be viewed as an essential
ingredient in most later formal operational thought. Rubin
(1973) has found that impersonal cognition (person to
object) and interpersonal cognition (person to person) are
based on the same underlying decentration process.

The connection between social and cognitive aspects
of development, then, are especially highlighted with
respect to autonomy. Piaget views the cognitive development
of reciprocity as a correlative aspect of the social

development of personal independence (Piaget, 1973).

Chandler (1973, 1974) has shown that planned experience with role-taking does effect changes in the levels of social adaptation on the part of individuals demonstrating delayed egocentric patterns of thought. This research suggests that a constructivist approach to decentering tasks in the classroom would foster movement away from egocentric patterns typically exhibited by disturbed children. The research addressing the connection between the social and cognitive aspects of this developmental question for autonomy further suggests that progress on either side affects the progress of the other (Chandler, 1973, 1974; Rubin, 1973). Thus developing educational plans that will aid a disturbed child in improving his decentering skills in a social area will have significant implications for this cognitive growth. Piaget views this process as not only remedial but as interactively spiralling toward improvement of the child's overall social and cognitive adaptation (Piaget, 1973).

In Piaget's view, social interaction is often responsible for stimulating questions, contradictions and the consequent reorganizing considered necessary for learning. It is, of course, a prior condition that the child have a sufficient amount of competence to recognize the contradictions presented in the group interaction

process. It is still the child's own activity that
eventually determines a pattern of reorganization, but
the stimulation experienced in productive peer group
dynamics is often an important aid in development.

Piaget sees this dynamic as less likely to set up
the typical dependencies found in teacher-centered
situations and to allow contradiction to be experienced
without pressure to accept the teacher's "right" answer or
without trying to please the teacher. The group membership
in early developmental stages provides an enormous influence
in changing intuitional patterns eventually into opera-
tional structures, and dependent behavior into more
independent functioning.

If developing social autonomy depends largely on
providing classroom experience with role-playing or other
activities that will encourage perspective-taking, then
cognitive autonomy, being closely aligned, requires
similar strategies. Its development requires both the
social versions of perspective-taking which interact with
the cognitive side, as well as intellectual tasks that
require viewing problems, strategies, visual or auditory
materials from another's point of view.

In order to further enhance the development of
autonomy, the teacher must refrain from applying external
reinforcement--at least in certain tasks. Giving children

praise--even though preferable to negative criticism--
reinforces their dependence on a controlling environment.
Giving them, instead, responses that encourage further
interactions that stimulate creativity and reasoning
strengthens internal regulation and independent thinking.
A teacher, according to this constructivist position,
should avoid giving praise as well as criticism, either of
which labels children's responses good or bad, right or
wrong. Instead they should be allowed to enjoy their
problem-solving efforts. Teachers might better be alert
for new problems to pose in order to improve upon their
methods whenever necessary (Forman and Hill, 1981).

Thus intrinsic reinforcement affects children's
autonomy as well as it affects the quality and effective
transfer of their learning. Developing their own patterns
of independent thought is crucial for disturbed children
whose dependence otherwise impedes their willingness to
risk and to inquire actively.

> If children, irrespective of developmental
> level, can be assisted in the world view,
> that static states are momentary positions
> in time, this helps them organize discrete
> events into a useful, functional scheme,
> and that in turn gives the locus of control
> back to the child . . . and assists the
> child's construction of an autonomous self
> (Forman and Hill, 1981, p. 40).

This does not mean that in a constructivist system
children will have complete freedom or that the teacher

takes an extreme permissive stance. On the contrary, the teacher functions as an authority figure, much needed by disturbed children for a feeling of security, but the authority of the teacher is not total, nor is it exerted unnecessarily. Educational planning is carried out with an eye toward cooperation between child and adult as well as among children, and with the focus upon the teacher setting the stage for the child's activity.

To the extent that a child is motivated extrinsically and generally reinforced or controlled externally, he is prevented from developing an autonomous pattern of functioning, of governing himself on the basis of convictions, values and knowledge constructed by himself.

Special children are regarded as needing special structure--a proposition which has most often resulted in a behaviorist approach designed to apply measures needed to attain such structure. Rigid schedules and sequences are totally inappropriate for these children and they are likely to be less able than normal children to follow such rigid programming or teaching styles which may not approximate their own learning style.

> To attempt to supplant their lack of inner structure with one that is externally imposed, is to avoid the issue altogether. Where internal structuration is lacking, children who are not helped to achieve better organizational strategies are at the mercy of their parents and teachers on whom they must rely to organize their thinking and activities for them (Reid, 1978b).

Classroom settings characterized by cooperative learning environments, as recommended by constructivists, have been shown to facilitate cognitive and social development, and to maintain gains over time (Doise, Mugny and Perret-Clermont, 1975; Knight-Arest and Reid, 1979). Furthermore, these children were able to use logical and unique arguments in explaining what they learned. The explanations reflected genuine cognitive and social changes, not merely imitation.

Using instructional strategies of cooperative effort in the classroom for building social and cognitive autonomy then, is an extension of Piagetian principles. The success of such strategies has been documented in several areas. Cooperative learning was found effective: (a) in academic content areas and in the acquisition of basic skills; (b) in greater mastery of higher level questions and advanced problem solving strategies, accompanied by success in specific information gains; and (c) in social and affective gains, more altruistic behavior, and the transfer of these gains across academic/social boundaries (Sharan, 1980; Slavin, 1980; Lazarowitz, Sharan and Steinberg, 1980).

Role of Error

> Mistakes are at the very base of human thought, embedded there, feeding the structure like root nodules. If we were not provided with the knack of being wrong, we could never get anything useful done (Thomas, 1974, p. 37).

Error, for the constructivist, is not something to be eliminated from the child's educational horizon. Rather, it serves a myriad of productive uses, as sketched earlier in this study with respect to the behaviorist inadequacies in this context. It is useful as a diagnostic tool for teachers to draw upon, as an opportunity to increase the affective strength of disturbed children via developing a safe forum in which to risk and to err. In the realm of cognitive development, error is significant in yielding insight for the child into his own interpretations, in suggesting interesting new approaches to other questions if incorrect in this instance. Its occurrence solidifies the right response in a more internalized way and as a result fosters retention of material (Blank, 1973; Forman and Kuschner, 1977). In terms of broader goals like coming to trust one's own thought processes, and finally in developing a self-correcting, self-regulating approach to learning, error is a significant factor.

Learning takes place through attempts to compensate for the disturbances occuring when inadequate assimilative schemes are applied. Errors, in this sense, are the very source of growth (Reid, 1978b). Piaget views contradiction and error as motivating forces, without which knowledge would remain static. According to this view, if error and contradiction lead to the compensations which in turn

foster re-equilibration of structures, it follows that
incremental learning steps designed to eliminate error will
lead, at best, to the acquisition of information but not
to higher levels of development.

We human beings are, according to some scientists,
programmed for error and should use it as a stepping stone
in inquiry.

> Other creatures do not seem to have DNA
> sequences for making mistakes as a routine
> part of daily living, certainly not for
> programmed error as a guide for action.
> . . . The lower animals do not have this
> splendid freedom. They are limited, most
> of them, to absolute infallibility (Thomas,
> 1974, p. 39).

Errors are seen as essential extensions from the
child's current concept to a more advanced, more equili-
brated level, as ways of reworking his knowledge base.
De-emphasizing dichotomies generally, and particularly with
respect to right and wrong, correct or incorrect, paves the
way for viewing responses or solutions along continua of
adequacy, appropriateness, efficacy, comprehensiveness and
so forth. This avoids in the educational setting itself
the devastating impact of a wrong response as characteris-
tically experienced by disturbed children. This view
restructures the process of knowing itself to accommodate
this notion of continua instead of dichotomies or polarized
opposites.

Then each error is seen as a progression toward a

more fully equilibrated response, a dynamic flow of developmental change which elicits less anxiety in children already over-anxious about potential failure. Such a procedure renders their errors self-informative, a process of feedback in a larger pattern of inquiry. This process builds a child's competence in handling ideas and sense of confidence in his ability to function more independently of the teacher's correction or praise (Blank, 1973; Forman and Kuschner, 1977).

Once again the intrinsic/extrinsic alignment in the constructivism/behaviorism comparison is relevant. With respect to error, here it is the disturbed child's own self-regulatory process that restructures an unworkable or erroneous solution; it is not an external authority figure reinforcing a right response. This intrinsic/extrinsic contrast between the two systems has been examined with respect to many issues in this study. The treatment of error by the constructivists supplies still another contrast by virtue of the intrinsic handling of error by the child himself. He is the locus of control, although the teacher retains an important role of posing appropriate questions and/or materials to foster the initiation of the child's self-regulation.

Active Inquiry

> Subject-matter never can be got into the child from without. Learning is active. It involves reaching out of the mind. It involves organic assimilation from within (Dewey, 1902, p. 9).

Active inquiry includes activity brought to bear on objects, active thought about the relationships and continuities between objects and events, as well as active focusing on the transformational elements and properties as opposed to static descriptors of objects and events. According to Piaget, children must not be encouraged merely to respond to the environment but rather to act upon it. Cowan (1978) uses the metaphor "interactive generator-transformer" to describe the child as learner, a term which he bases on Piagetian epistemology. It suggests the dynamic relationship of the child to his environment and the active mode which inquiry must take.

Thus activity functions in a constant way in a constructivist curriculum although at some developmental stages it is more overt and obvious, more directly related to objects, while at other later stages it is less directly related to objects and events in the environment. In attempting to teach some principle at early stages, the initial presentation should be couched in concrete terms, with direct manipulation involved. The activity is focused upon objects. Then the activity can become more internalized and schematic by reducing perceptual and motor supports,

from objects to symbols or from motor action to speech.

Significant supporting data regarding the importance
of active exploration for functional and conceptual growth
have come from the field of psycho-biology. Because these
experiments dramatize so powerfully and, in another mode
of verification, demonstrate the importance of this kind
of activity for learning, several are described here.

Experiments were performed in which visual perception
was distorted by artificial lenses--those that inverted the
picture of surrounding space, or those that divided left
and right into blue and yellow, are but two of many
examples. Subjects were divided into groups either passive
or active in their approach to their new perceptual
experience . In all cases, the active, exploring group
adjusted and corrected the distortion while the passive
group experienced difficulty and often never accommodated
at all (Kohler, in Restak, p. 1979, p. 116).

Kohler concluded that the accuracy of our perceptions
about the world and our extraction of knowledge from the
data both depend on our ability to actively explore our
environment.

> Drs. R. Held and A. Hein reared a litter of
> kittens in complete darkness until the time
> of their ingenious experiment. One kitten
> was then freed to explore the environment
> while dragging a basket containing a second
> kitten. (A pully arrangement enabled the
> second kitten's basket to move through the

> same territory covered by the active kitten.)
> These researchers discovered that the first
> kitten, the active explorer, developed percep-
> tion, while the passive animal remained blind
> (Restak, 1979, p. 117).

Thus Restak, in analyzing this research views the
process of developing a picture of reality as an "act of
construction." Even if the probabilities are skewed--as
in the experimental distortions or the kittens' initial
deprivation, and ensuing impressions are "wrong," correction
can be made if there is an opportunity to interact with
the stimulus. He sees the results of this research as
emphasizing the role of activity in perceptual learning
and in cognitive development in general.

The role of active exploration in cognitive develop-
ment is again demonstrated in an experiment of Dr. Mark
Rosenzweig in which he sought to find the impact of
environmental stimulation of actual physiological brain
growth. In the experiment, three contrasting environments
were contrived: in the first group single rats remained
in the standard laboratory group cage with two others; the
second group consisted of single rats in solitary confine-
ment, having no opportunity for social interaction; the
third or enriched environment provided many toys and a
larger space in which these rats could move about. Then
the brains of each rat were examined.

> In all cases, the rats from the enriched
> environment showed an increase in the number

of nerve cells and a greater weight of cerebral
cortex, along with a thicker cortical covering.
In addition, important brain enzymes showed
significant elevations, which are thought to
correlate with a greater number of connections
between nerve cells and heightened cerebral
arousal (Restak, 1979, pp. 124-125).

In Restak's view, "the brain does not so much develop
as respond to tens of thousands of environmental variables."
One variable that the behaviorists often overlook is
novelty-seeking. Psychologist David Hebb constructed an
experiment in which both a familiar, direct route and an
unfamiliar, circuitous route were offered to rats and
contrary to a behaviorist expectation, the novel, new path
was chosen as often as the familiar (Restak, 1979).
Perhaps, then, novelty itself is rewarding, as well as the
explorations involved in the process.

This finding lends support to the data collected by
educators and epistemologists suggesting that active inquiry
promotes cognitive development in a way that passive absorp-
tion of information never could. It tends to corroborate
the constructivist view that in order to acquire knowledge,
the environment must be transformed, acted-upon, manipu-
lated, explored. "The immature brain is dependent on
sensory stimulation for normal growth, development and
function. Sensory stimulation has, in fact, been compared
to a 'nutrient'" (Restak, p. 143).

Further support for an active inquiry approach comes

from advocates in the field of information-processing who do not believe that mental representations are stored as permanently organized cognitive maps, but are rather actively reconstructed from sets of stored cues whenever a specific issue or problem arises. They view development as the result of changes in the reconstruction rules (Cellerier, 1976). There is active process in the construction of knowledge as well as in the up-dating and restructuring of the methods of exploration themselves.

These findings corroborate the importance of providing opportunities for children to explore, actively inquire, reflect on their findings and restructure, presumably each time on a higher developmental level. The spiralling upward toward more sophisticated levels of thought is certainly delayed and erratic for disturbed children, as noted earlier in this study, but emphasis on the active, process-oriented aspects of educational experiences would provide greater progress toward intellectual competence and independence (Reid, 1978a, 1978b; Schmidt-Kitsikis, 1973; Cellerier, 1976; Safford, 1978).

The Role of the Teacher. Acceptance of a Piagetian framework concerning the primacy of activity in an educational setting for disturbed children requires a considerable re-orientation from the predominating behaviorist view.

First, it suggests a significant change in the role of the teacher. In a behaviorist setting, the teacher is typically the active center of functioning, reinforcing responses of the children to the transmission of knowledge. In a constructivist setting, the teacher functions as a guide to assist the child construct his own knowledge, to strengthen the child's processes of reasoning, to promote exploration, to present materials and devices that will stimulate problem-solving and to provide counter-examples that compel reflection and reconsideration of over-hasty solutions.

The role of the teacher in this paradigm suggests an approach strikingly different also from a maturationist view. Piaget does not maintain that educators can sit back and wait for maturation to accomplish the task of developing reason. On the contrary, he recommends that educators can devise experimental situations to facilitate the child's invention of knowledge.

Because intelligence increases, according to Piaget (1970b) when the knower becomes sensitized to changes and becomes attued to transformations instead of focussing only on static properties, every effort should be made in educational programs to plan for emphasizing change. The teacher should provide experiences that bring children to terms with these active elements.

As discussed earlier in this study, emotionally disturbed children tend to focus almost exclusively on static elements of their experience. In order to overcome this, teachers must foster an attitude of inquiry, avoiding curricula based only on convergent thinking models; secondly, they must plan for active involvement with materials and open-ended, divergent inquiry; and finally, they must emphasize the active transformations occurring in and among objects and events, not merely the passive observation of static states.

"Piaget demands that the teacher be an investigator who is constantly observing, testing hypotheses, and modifying materials and strategies to adapt to the child's developmental propensities" (Elkind, 1979, p. 10). The teacher, then, is expected to function actively also, as well as to foster active inquiry on the part of the child. This model of active functioning is important for disturbed children. It offers a transitional model of imitating the active methods demonstrated by the teacher. It is a way of utilizing their dependence on authority, gradually to take on the active patterns they observe, and eventually to move away from passive dependence on authority toward a more active, independent functioning. The locus of organization must be increasingly vested in the children, not in the teacher's centralized and absolute authority.

It is the teacher's job to support open-ended inquiry, for without such support these children, as described earlier, tend toward static, non-risk approaches and would not be likely to expand their systems of inquiry and would remain at lower levels of cognitive functioning. The teacher must undertake the on-going role of diagnostician-- essentially in an informed way to determine how each individual is processing the experiences provided and to decide how best to provide the optimum challenge for that child.

The teacher's responsibility in a constructivist setting, then, is not primarily to transmit knowledge in terms of facts or concepts presented, but rather to encourage the child's active participation on both physical and mental levels. This participation occurs on different levels each successively depending on the other. First, activity occurs at the motoric level in which the child acts directly on objects, manipulating their physical properties in space. The next level involves developing intuitive internal versions of activity; this level is no longer dependent on overt manipulation and no longer limited by spatial and temporal restrictions. Finally, there is the level of verbal understanding and analytical thought, which is essentially an abstraction of activity. It is important to recognize that the higher levels

directly depend upon the lower and that activity remains

a significant element even when thought becomes abstracted.

Importance of Social Interaction. For Piaget, social

interaction is an important element of the process of

active construction of knowledge. The emphasis is similar

to the action upon objects in that for development to

occur, there must be individual action upon a human group

with ensuing response by the group. The child's passive

presence in a social group will not necessarily foster

the successful coordination of his mental actions any more

than a passive relation to objects will foster a full

understanding of the object. The active participation of

a child within his social group implies his place as a

part within a whole, individually involved in the shifts

and changes of balance occurring within the group. "Such

a system of human relationships replicates the properties

of mental operations. It allows the child to become

himself, an action within a co-ordinated system of actions"

(Richmond, 1970, p. 95).

Educationally, this suggests groups engaged in common

activity--an occurrence especially important for disturbed

children who tend to react passively, focusing on static

elements of a learning situation, and who tend to be

dependent upon authority for answers. This emphasis on

group activity and inquiry would lead to the need for

verification or justification of the child's own ideas, to make adjustments to differing opinions and concessions to contradictions and general discussion of these issues. "As far as intelligence is concerned, co-operation is thus an objectively conducted discussion (out of which arises internalized discussion, i.e., deliberation and reflection)" (Piaget, 1950, p. 162). Once again, overt action sets the initial stage from which internalized, higher level functioning will develop later.

Curriculum Issues. A constructivist-based educational setting is essentially an open system premised on learning through active participation with emphasis on developing the autonomy which is so problematic for disturbed children. It is important for these children that they construct some of their own boundaries and constraints and not have them constantly set by external authority. They typically demonstrate inappropriate beliefs and fantasies, lack of attention, and uncontrollable impulses, all of which tend to curb exploration or to provoke teachers to authoritatively curb exploration and restrict their range and scope of investigation.

With these characteristics in mind, a constructivist educator would choose to plan curriculum experiences that help the child to risk exploration, to investigate a perplexing problem. The experiences have the additional

advantage for disturbed children of providing contact with
the world as others perceive it, of making predictions or
estimates about a real world that can be corroborated
outside their egocentric boundaries.

Papert (1980) recommends a curriculum along these
lines in which children construct their own "microworlds"
focusing on certain elements, assumptions and constraints
that allow exploration to be undisturbed by extraneous
questions of fact or accuracy. They can then transfer the
personal skills and habits acquired in their microworld
to the more formal domain of scientific inquiry. This
helps to avoid the dissociated relationship disturbed
children often experience in reaction to assigned content
not originating from their own involvement with materials
and ideas. Such dissociation is seen by Papert to be often
responsible for a child's failure to learn. They have been
forced out of meaningful relation to the material and have
adopted the most unproductive attitude of either noncompli-
ance or rote learning to please the teacher.

The constructivist emphasis of process and activity
in the education of disturbed children shifts the focus
considerably from the behaviorist perspective emphasizing
content to be transmitted and behavior to be controlled.
The focus of such an active program is clearly on the
process of developing resources, active approaches to the

environment which follows essentially William James'
definition of education: "In the last analysis, education
consists of the organizing of <u>resources</u> in the human being,
of powers of conduct which shall fit him to his social and
physical world" (James, 1899, p. 15).

Piaget's theory provides a conceptual basis for
viewing exceptional children in terms of capabilities, and
for understanding the compensations these children make
between their accommodations to objects and their assimila-
tory schemes. Its emphasis on active inquiry and developing
autonomy, as well as its methods of dealing with error and
conflict, form the basis of an approach offered as an
important, effective alternative to the behaviorist paradigm
currently influencing the education of disturbed children.

<u>Concluding Remarks</u>

Because behavior modification has held such
predominant sway in the education of emotionally disturbed
children, this study has devoted considerable attention to
a critique of behaviorist conceptual foundations and
applied practices in the education of this group. This
inquiry has produced ample evidence to suggest the urgent
need to give serious consideration to an alternative frame-
work for viewing the problem and elaborating more effective
pedagogical practices, a framework that goes beyond the

limited, unidimensional orientation of behaviorism. It is contended that constructivism provides an explanatory framework that is significantly more sensitive and adequate for understanding the dynamics of emotional disturbance and growth, and yields an approach to pedagogy which is both more sound and effective for the basic learning needs of children with this disorder. Consequently the conceptual foundations of constructivism and the pedagogical implications of this approach have been examined.

While significant applications of the constructivist perspective have been made in the education of normal children (Furth and Wachs, 1975; Forman and Kuschner, 1977; Kamii·and DeVries, 1977; Forman and Hill, 1980), the extension of these principles to the education of disturbed children is only just beginning. When they have been used with this group, the principles have often been applied superficially. There has been either a tendency to focus directly on the developmental tasks per se, or to overemphasize the developmental stages themselves. In either case individual processes of learning are neglected. What is needed is an increased interest in and application of equilibration theory within these educational settings. The approach should be pursued as a useful framework and vantage point from which to observe, understand and modify the particular strategies employed by these children.

What can be most productively drawn from Piaget's work for application to the education of disturbed children is his emphasis on independent inquiry--on learning how to learn. This presupposes teachers who are prepared in their knowledge of child development and who understand how to pose stimulating problems and provide provocative materials and experiences; teachers whose observations and interpretations of children's actions are sufficiently astute to plan in an on-going fashion for appropriate levels of cognitive conflict. The teacher in this model must be able, through probing questions, to lead the child to focus on certain productive aspects of an object or event. Then the next task would be to take the child's responses and plan further questions or strategies that will elicit growth. Such educational experiences must be arranged for disturbed children so that they can learn to organize their own theories and activity according to whatever idiosyncratic or tentative structures they possess.

If the constructivist alternative is to become a viable and more practiced option in the education of emotionally disturbed children there are a number of areas where further development is needed.

In view of the tendency of practitioners to feel that the nature of the emotionally disturbed indicates that modifying behavior is the most that can reasonably be

expected, one research need is to study more carefully the actual educational options following from constructivist theory.

Research on the connection between the experience of chronic emotional conflict and the practice of induced cognitive conflict might yield important findings which could be productively applied in a constructivist educational setting.

There is a need to articulate the relationships between impersonal and personal object permanence and the consequent effect on emotional disturbance. Understanding the ways in which to compensate for this in educational terms would be invaluable for the growth of these children.

Since the constructivist approach depends greatly on the qualities and capacities of teachers, training strategies and methods need to be developed, as well as other teacher support measures.

While constructivism may be a more demanding approach that behaviorism within an educational setting, its application as outlined in this study suggests promising results in promoting long-term cognitive, social and emotional growth for disturbed children.

BIBLIOGRAPHY

Anderson, C. Speak no freewill (Piaget vs. Skinner) (Rep.
    38). Ann Arbor, Michigan: University of Michigan,
    Developmental Program, February 1974.

Andrews, G. The results of a pilot program to train
    teachers in the classroom application of behavior
    modification techniques. Journal of School Psychology,
    1970, 8, 37-42.

Anthony, E. J. The significance of Piaget for child
    psychiatry. British Journal of Medical Psychology,
    1956, 29, 20-34.

Anthony, E. J. The behavior disorders of childhood. In
    P. Mussen (Ed.), Carmichael's manual of child
    psychiatry. New York: Wiley, 1970.

Appel, M. H., & Goldberg, L. S. Topics in cognitive
    development (Vol. 1). New York: Plenum Press, 1977.

Axtelle, J. L. (Ed.) The educational writings of John
    Locke. Cambridge, Massachusetts: Harvard University
    Press, 1968.

Baer, A., Rowbury, T., & Baer, D. The development of
    instructional control over classroom activities of
    deviant preschool children. Journal of Applied
    Behavioral Analysis, 1973, 6, 289-298.

Baldwin, A. L. Theories of child development. New York:
    Wiley, 1967.

Bandura, A. Behavior theory and the models of man.
    American Psychologist, December 1974, 859-869.

Bandura, A. Social learning theory. Englewood Cliffs, New
    Jersey: Prentice Hall, 1977.

Berman, D. S. Cognitive-behaviorism as a dialectical contra-
    diction: The unity of opposites. Human Development,
    1978, 21, 248-254.

Bijou, S., & Baer, D. Child development (Vol. 1). New
    York: Appleton-Century-Crofts, 1961.

Blank, M. Teaching learning in the preschool: A dialogue approach. Columbus, Ohio: Merrill, 1973

Blanshard, B., & Skinner, B. F. The problem of consciousness--A debate. Philosophy and Phenomenological Research, 1967, 27, 317-337.

Blatt, B., & Garfunkel, F. Teaching the mentally retarded. In R. M. W. Travers (Ed.), Second handbook of research on teaching: A project of A.E.R.A. Chicago: Rand McNally, 1973.

Brainerd, C. J. Piaget's theory of intelligence. Englewood Cliffs, New Jersey: Prentice-Hall, 1978.

Breger, L. The ideology of behaviorism. In L. Breger (Ed.), Clinical-cognitive psychology: Models and integrations. Englewood Cliffs, New Jersey: Prentice-Hall, 1969.

Breland, K., & Breland, M. The misbehavior of organisms. American Psychologist, 1961, 16, 681-684.

Bridgeman, P. W. The way things are. Cambridge, Massachusetts: Harvard University Press, 1959.

Broden, M., Hall, R. V., Dunlap, A., & Clark, R. Effects of teacher attention and a token reinforcement system in a junior high school special education class. Exceptional Children, 1970, 36, 341-349.

Brown, R., & Herrnstein, R. G. Psychology. Boston: Little, Brown, 1975.

Buckhold, D. R., & Gulbrium, J. F. The underlife of behavior modification. American Journal of Orthopsychiatry. April, 1980, 50(2).

Bullock, L. M., Dykes, M. K., & Kelly, T. G. Educational aspects of behavioral problems in children and youth (2 vols.). New York: M.S.S. Information Corporation, 1974.

Burnham, W. The normal mind. New York: Appleton, 1924.

Carpenter, F. The Skinner primer: Behind freedom and dignity. New York: The Free Press, 1974.

Case, R. The role of maturation in the process of intellectual development. Canadian Psychological Review, 1976, 17, 270-288.

Catania, A. C., & Brigham, T. A. (Eds.). Handbook of applied behavior analysis: Social and instructional processes. New York: Irvington, 1978

Cellerier, G. Information processing tendencies in recent experiments in cognitive learning--Theoretical implications. In B. Inhelder, H. H. Chipman, & C. Zwingman (Eds.), Piaget and his school. New York: Springer-Verlag, 1976.

Chadwick, B., & Day, R. Systematic reinforcement: Academic performance of underachieving students. Journal of Applied Behavior Analysis, 1971, 4, 311-319.

Chandler, M. J. Egocentrism in normal and pathological child development. In F. Monks, W. Hartup, & G. DeWitt (Eds.), Determinants of behavioral development. New York: Academic Press, 1972.

Chandler, M. J. Egocentrism and antisocial behavior: The assessment and training of social perspective-taking skills. Developmental Psychology, 1973, 9, 326-332.

Chandler, M. J. Social cognition. In W. F. Overton, & G. M. Gallagher, Knowledge and Development (Vol. 1). New York: Plenum Press, 1977.

Chomsky, N. The case against B. F. Skinner. New York Review, December 30, 1971, 18-24.

Cowan, P. A. Piaget with feeling: Cognitive, social, and emotional dimensions. New York: Holt, Rinehart and Winston, 1978.

Creak, M. Childhood psychosis: A review of 100 cases. British Journal of Psychiatry, 1963, 109, 84-89.

Cruickshank, W. M. (Ed.). Psychology of exceptional children and youth (4th ed.). Englewood Cliffs, New Jersey: Prentice-Hall, 1980.

Cruickshank, W. M., Bentzen, F. A., Ratzeberg, F. H., & Tanhauser, M. T. A teaching method for brain-injured and hyperactive children. Binghamton, New York: Syracuse University Press, 1962.

Deese, J. Behavior and fact. American Psychologist, 1969, 24(5), 515-522.

DeVries, R. Early education and Piagetian theory. In
        J. M. Gallagher & J. A. Easley, Jr., Knowledge and
        development (Vol. 2). New York: Plenum Press, 1978,
        75-92.

Dewey, J. The child and the curriculum and the school and
        society. Chicago: The University of Chicago Press,
        1960. (Originally published, 1902.)

Doise, W., Mugny, G., & Perrot-Clermont, A. Social inter-
        action and the development of cognitive operations.
        European Journal of Social Psychology, 1975, 3.

Dubos, R. The dreams of reason. New York: Columbia
        University Press, 1961.

Duckworth, E. Piaget takes a teacher's look. Learning,
        1973, 2(2), 22-27.

Duckworth, E. Either we're early and they're not ready or
        we're too late and they know it already. Harvard
        Education Review, 1979, 49, 297-312.

Dupont, H. (Ed.). Educating emotionally disturbed children
        (2nd ed.). New York: Holt, Rinehart and Winston,
        1974.

Eisley, L. Darwin's century: Evolution and the men who
        discovered it. Garden City, New York: Doubleday,
        1958.

Elkind, D. Piaget and developmental psychology. In F. B.
        Murray, (Ed.), The impact of Piagetian theory.
        Baltimore: University Park Press, 1979.

Evans, E. D. Contemporary influences in early childhood
        education (2nd ed.). New York: Holt, Rinehart and
        Winston, 1975.

Fagen, S., Long, N., & Stevens, D. Teaching children self-
        control. Columbus, Ohio: Charles E. Merrill, 1975.

Feffer, M. H. The cognitive implications of role-taking
        behavior. Journal of Personality, 1959, 27, 152-168.

Feffer, M. H. A developmental analysis of interpersonal
        behavior. Psychological Review, 1970, 77, 197-214.

Feffer, M. H., & Gourevitch, V. Cognitive aspects of role-taking in children. _Journal of Personality_, 1960, _28_, 383-396.

Feffer, M. H., & Suchotliff, L. Decentering implications of social interaction. _Journal of Personality and Social Psychology_, 1966, _4_, 415-422.

Feigl, H., & Scriven, M. (Eds.). _Minnesota studies in the philosophy of science_. Minneapolis: University of Minnesota Press, 1956.

Fenichel, C. Psycho-educational approaches for seriously disturbed children in the classroom. In H. W. Harshman (Ed.), _Educating the emotionally disturbed: A book of readings_. New York: Thomas Y. Crowell, 1969.

Ferster, C. B. _Arbitrary and natural reinforcement_. Washington, D. C.: American Association for the Advancement of Science, 1966.

Ferster, C., & Skinner, B. F. _Schedules of reinforcement_. Englewood Cliffs, New Jersey: Prentice-Hall, 1957.

Festinger, L. _A theory of cognitive dissonance_. Evanston, Illinois: Row, Peterson, 1957.

Flavell, J. H. _Cognitive development_. Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

Forman, G. E. Constructivism: Piaget. In G. M. Gazda, & R. J. Corsini (Eds.), _Theories of learning_. Itasca, Illinois: F. E. Peacock Publishers, 1980.

Forman, G. E., & Hill, D. F. _Constructive play: Applying Piaget in the preschool_. Monterey, California: Brooks/Cole, 1980.

Forman, G., & Hill, D. F. Constructive play in developmentally delayed preschool children. _Topics in Learning and Learning Disabilities_, 1981, _1_(1), 31-43.

Forman, G., & Kuschner, D. _The child's construction of knowledge: Piaget for teaching children_. Monterey, California: Brooks/Cole, 1977.

Forness, S., & MacMillan, D. Reinforcement overkill: Implications for education of the retarded. _Journal of Special Education_, 1972, _6_, 221-230.

Furth, H. G. Piaget and knowledge: Theoretical foundations. Englewood Cliffs, New Jersey: Prentice-Hall, 1969.

Furth, H. G. Children's societal understanding and the process of equilibration. In New directions for child development: Social cognition. San Francisco: Jossey-Bass, 1978.

Furth, G., & Wachs, H. Thinking goes to school: Piaget's theory in practice. New York: Oxford University Press, 1975.

Gallagher, J. M., & Easley, J. A., Jr. Knowledge and development (Vol. 2). New York: Plenum Press, 1978.

Gallagher, J. M., & Reid, D. K. The learning theory of Piaget and Inhelder. Monterey, California: Brooks/ Cole, 1981.

Gallwey, T. W. The inner game of tennis. New York: Random House, 1974.

Garrison, M., Jr. Development of a Piagetian curriculum for exceptional children. Longhorne, Pennsylvania: The Woods Schools and Residential Treatment Center, 1968.

Garwood, S. (Ed.). Educating young handicapped children: A developmental approach. Germantown, Maryland: Aspen Systems Corporation, 1979.

Gates, L. Piaget and Skinner: A reply to a reply. Reading Improvement, 1980, 17(2), 97-99.

Gazzaniga, M. S., & LeDoux, J. E. The integrated mind. New York: Plenum Press, 1978.

Gearheart, W. R. Special education for the 80s. St. Louis: The C. V. Mosby Company, 1980.

Goldfarb, W. Childhood psychosis. In P. Mussen (Ed.), Carmichael's manual of child psychiatry (Vol. 2). New York: Wiley, 1970.

Grass, L., & Kreger, R. Application of psychoanalytic, cognitive, psychosocial and other theories in the developmentally integrated assessment and treatment of emotionally disturbed children. The Council for Exceptional Children, 56th Convention, Kansas City, Missouri, May 2-5, 1978 (Session F81).

Guralnick, M. (Ed.). Early intervention and the integration of handicapped and nonhandicapped children. Baltimore: University Park Press, 1977.

Hammill, D., & Bartel, N. Teaching children with learning and behavior problems. Boston: Allyn & Bacon, 1975.

Hanley, E. Review of research involving applied behavior analysis in the classroom. Review of Educational Research, 1970, 40, 597-626.

Hanson, N. R. Patterns of discovery. Cambridge: Cambridge University Press, 1958.

Haring, N. G. Behavior of exceptional children. Columbus, Ohio: Charles E. Merrill, 1974.

Haring, N., & Phillips, E. Analysis and modification of classroom behavior. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.

Harshman, H. W. (Ed.). Educating the emotionally disturbed. New York: Thomas Crowell, 1969.

Hass, W. A. Developmental dialectics as a neo-Piagetian framework for the helping professions. In Proceedings of the seventh annual interdisciplinary conference on Piagetian theory and the helping professions. Los Angeles: University of Southern California, 1977.

Hewett, F. M. The emotionally disturbed child in the classroom. Boston: Allyn & Bacon, 1968.

Hewett, F. M. Education of exceptional learners. Boston: Allyn & Bacon, 1974.

Hewett, F. M., Taylor, F. D., & Artuso, A. A. The Santa Monica project: Evaluation of an engineered classroom design with emotionally disturbed children. Exceptional Children, 1969, 35, 523-529.

Hill, B. V. Review Article--Behavior, learning and control: Some philosophical difficulties in the writings of B. F. Skinner. Educational Theory, 1971-72, 21-22, 230-241.

Hilts, P. J. Behavior modification. New York: Harpers Magazine Press, 1974.

Honig, W. K., & Staddon, J. E. R. (Eds.). Handbook of operant behavior. Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

Hughes, J. A case study in behavioral consultation. School Psychology Review, 1980, 9(1), 103-107.

Hull, C. Conditioning: Outline of a systematic theory of learning. Yearbook of the National Society for the Study of Education, 1942, 41(2), 61-97.

Hull, C. A behavior system. New Haven, Connecticut: Yale University Press, 1952.

Inhelder, B. Some pothologic phenomena analyzed in the perspective of developmental psychology. In B. Inhelder, & H. H. Chipman (Eds.), Piaget and his school. New York: Springer-Verlag, 1976.

Inhelder, B., & Chipman, H. H. (Eds.). Piaget and his school: A reader in developmental psychology. New York: Springer-Verlag, 1976.

Inhelder, B., & Karmiloff-Smith, A. If you want to get ahead get a theory. Cognition, 1976, 3, 195-212.

Inhelder, B., Sinclair, H., & Bovet, M. Learning and the development of cognition. Cambridge, Massachusetts: Harvard University Press, 1974.

Jaynes, J. The routes of science. In M. Marx, & F. Goodson (Eds.), Theories in contemporary psychology. New York: MacMillan, 1976.

Jensen, A. R. Social class and verbal learning. In M. Deutch, I. Katz, & A. R. Jensen (Eds.) Social class, race and psychological development. New York: Holt, Rinehart and Winston, 1968.

Johnston, M., Kelly, C., Harris, F., & Wolf, M. An application of reinforcement principles to development of motor skills of a young child. Child Development, 1966, 37, 379-387.

Joynson, R. B. Breakdown of modern psychology. Bulletin of the British Psychological Society, 1970, 23, 261-269.

Kamii, C. Piaget's theory, behaviorism, and other theories in education. Journal of Education, 1979, 161(1), 13-33.

Kamii, C. Autonomy as the aim of education: Implications of Piaget's theory. Unpublished article, August 1981.

Kamii, C., & Derman, L. The Englemann approach to teaching logical thinking: Findings from the administration of some Piagetian tasks. In D. R. Greens, M. P. Ford, & G. B. Flamer (Eds.), Measurement and Piaget. New York: McGraw-Hill, 1971.

Kirk, S. A., & Gambrill, E. D. The convergence of the interactionist and behavioral approaches to deviance. Journal of Sociology and Social Welfare, 1975, 3(1), 48-59.

Knight-Arest, I., & Reid, D. K. Peer interaction as a catalyst for conservation acquisition in normal and learning disabled children. Proceedings of the ninth annual conference on Piagetian theory and the helping professions. Los Angeles: University of Southern California, 1979.

Knoblock, P. Psychological considerations of emotionally disturbed children. In W. M. Cruickshank (Ed.), Psychology of exceptional children and youth (4th ed.). Englewood Cliffs, New Jersey: Prentice-Hall, 1980.

Koch, S. (Ed.). Psychology: A study of a science (Vol. 3). New York: McGraw-Hill, 1959.

Koch, S. Psychological science versus the science-humanism antinomy: Intimations of a significant science of man. American Psychologist, 1961, 16, 629-639.

Koch, S. Psychology and emerging conceptions of knowledge as unitary. In T. W. Wann (Ed.), Behaviorism and Phenomenology. Chicago: University of Chicago Press, 1964.

Koch, S. Psychology cannot be a coherent science. Psychology Today, September 1969.

Koch, S. Reflections on the state of psychology. Social Research, 1971, 38, 669-709.

Koch, S. More verbal behavior from Dr. Skinner. Contemporary Psychology, 1976, 21, 453-457.

Koch, S. The nature and limits of psychological knowledge. American Psychologist, 1981, 36(3), 257-269.

Kreinberg, N., & Chow, H. L. (Eds.). Configurations of change: The integration of mildly handicapped children with the regular classroom. San Francisco: Far West Laboratory for Educational Research and Development, 1973,

Krumbolz, J., & Krumbolz, H. Changing children's behavior. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.

Kuhn, D. Intellectual development beyond childhood. In New directions for child development (No. 5). San Francisco: Jossey-Bass, 1979.

Kuhn, D. & Phelps, E. A methodology for observing development of a formal reasoning strategy. New directions for child development (No. 5). San Francisco: Jossey-Bass, 1979.

Kuhn, T. S. The structure of scientific revolution (2nd ed.). Chicago: University of Chicago Press, 1970.

Langer, J. Theories of development. New York: Holt, Rinehart and Winston, 1969.

Lazarowitz, R., Sharan, S., & Steinberg, R. Classroom learning style and cooperative behavior of elementary school children. Journal of Educational Psychology, 1980, 72, 97-102.

Locke, J. An essay concerning human understanding. Chicago: Regnery, 1956. (Originally published, 1690.)

Lubin, G. I., Poulsen, M. K., Magary, J. F., Soto-McAlister, M. Piagetian theory and its implications for the helping professions: Proceedings of the seventh annual interdisciplinary conference (2 vols.). Los Angeles: University of Southern California, 1978.

Maccoby, E. E., & Zellner, M. Experiments in primary education: Aspects of project follow-through. New York: Harcourt, Brace, Jovanovich, 1970.

Mackenzie, B. D. Behaviorism and the limits of scientific method. London: Routledge and Kegan Paul, 1977.

MacMillan, D. L., & Forness, S. R. Behavior modification: Limitations and liabilities. Exceptional Children, December 1970, 291-297. (a)

MacMillan, D. L., & Forness, S. R. The origins of behavior modification with exceptional children. Exceptional Children, October 1978, 93-99. (b)

McNally, D. W. Piaget, education and teaching. Sussex, England: New Educational Press, 1974.

Madden, P. C. Skinner and the open classroom. School Review, 1972, 81, 101-107.

Madson, C. H., & Madson, C. K. Teaching discipline. Boston: Allyn & Bacon, 1970.

Malcolm, N. Behaviorism as a philosophy. In T. W. Wann (Ed.), Behaviorism and phenomenology. Chicago: The University of Chicago Press, 1964.

Mann, L., & Phillips, W. Fractional practices in special education: A critique. In D. Hammill, & N. Bartel (Eds.), Educational perspectives in learning disabilities. New York: Wiley, 1971.

Marks, E. Evaluating the concept of number in schizophrenic children through the use of several Piagetian tasks. Slow Learning Child, 1972, 19(2), 92-101. (a)

Marks, E. Slow learning children. Australian Journal on the Education of Backward Children, 1972, 19, 92-101. (b)

Marx, M. Theorizing. In M. H. Marx, & F. E. Goodson (Eds.), Theories in contemporary psychology (2nd ed.). New York: Macmillan, 1976.

Marx, M., & Goodson, F. E. (Eds.). Theories in contemporary psychology (2nd ed.). New York: Macmillan, 1976.

Maslow, A. H. The psychology of science. New York: Harper & Row, 1966.

Meisels, J. Special education and development: Perspectives on young children with special needs. Baltimore, Maryland: University Park Press, 1979.

Milhollan, F., & Forish, B. E. From Skinner to Rogers: Contrasting approaches to education. Lincoln, Nebraska: Professional Educations Publications, 1972.

Miller, L. B., & Dyer, J. L. Four preschool programs: Their dimensions and effects. Society for Research in Child Development Monograph, 1975 (Serial No. 162).

Mischel, T. Piaget and the nature of the psychological explanations. In F. B. Murray (Ed.), The impact of Piagetian theory. Baltimore: University Park Press, 1979.

Moessinger, P. Piaget on contradiction. Human Development, 1977, 20, 178-184.

Morreau, L., & Daley, M. Behavioral management in the classroom. New York: Appleton-Century-Crofts, 1972.

Murray, B. (Ed.). The impact of Piagetian theory. Baltimore: University Park Press, 1979.

Nagel, E. The structure of science: Problems in the logic of scientific explanation. New York: Harcourt, Brace, Jovanovich, 1961.

Neale, J. M. Egocentrism in institutionalized and non-institutionalized children. Child Development, 1966, 36, 97-101.

Neisser, U. Cognition and reality. San Francisco: W. H. Freeman, 1976.

O'Leary, K. D., & Becker, W. C. Behavior modification of an adjustment class: A token reinforcement program. Exceptional Children, 1976, 33, 637-642.

O'Leary, K. D., & O'Leary, S. Classroom management: The successful use of behavior modification. New York: Pergamon Press, 1972.

Oppenheimer, J. R. Science and culture. Encounter, 1962, 19(4), 3-10.

Overton, W., & Gallagher, J. M. Knowledge and development (Vol. 1). New York: Plenum Press, 1977.

Papert, S. Mindstorms: Children, computers and powerful ideas. New York: Basic Books, 1980.

Payne, J. S., Kaufman, J. M., Brown, G. B., & Demott, R. M. Exceptional children in focus: Incidents, concepts, and issues in special education. Columbus, Ohio: Merrill, 1974.

Petrie, A., McCulloch, R., & Kazdin, P. The perceptual characteristics of juvenile delinquents. Journal of Nervous and Mental Disease, 1962, 134, 415-421.

Piaget, J. The psychology of intelligence. New York: Harcourt, Brace, 1950.

Piaget, J. The language and thought of the child. London: Routledge & Kegan Paul, 1952.

Piaget, J. Cognitive development in children. In R. Ripple, & V. Rockcaste (Eds.), Piaget rediscovered. Ithaca, New York: Cornell University, 1964.

Piaget, J. Genetic epistemology. New York: W. W. Norton, 1970. (a)

Piaget, J. Piaget's theory. In P. H. Mussen (Ed.), Carmichael's manual of child psychology (Vol. 1). New York: Wiley, 1970. (b)

Piaget, J. Insights and illusions of philosophy. New York: World Publishing, 1971. (Original French edition, 1965.) (a)

Piaget, J. The science of education and psychology of the child. New York: The Viking Press, 1971. (b)

Piaget, J. The child's conception of the world. Totown, New Jersey: Littlefield Adams, 1972. (a)

Piaget, J. The relation of affectivity to intelligence in the mental development of the child. In S. I. Harrison, & J. F. McDermott (Eds.), Childhood psycho-pathology. New York: International University Press, 1972. (b)

Piaget, J. To understand is to invent: The future of education. New York: Grossman Publishers, 1973. (Originally published, 1948.)

Piaget, J. Foreword. In H. Sinclair, & L. Bouet, Learning and the development of cognition. Cambridge, Massachusetts: Harvard University Press, 1974.

Piaget, J. Piaget's theory. In B. Inhelder, H. H. Chipman, & T. Zwingmann (Eds.), Piaget and his school: A reader in developmental psychology. New York: Springer-Verlag, 1976.

Piaget, J. The role of action in the development of thinking. In W. Overton, & J. M. Gallagher (Eds.), Knowledge and development. New York: Plenum, 1977.

Piaget, J., & Inhelder, B. Psychology of the child. New York: Basic Books, 1969.

Piaget, J., & Inhelder, B. The gaps in empiricism. In B. Inhelder, & H. H. Chipman (Eds.), Piaget and his school. New York: Springer-Verlag, 1976.

Polanyi, M. The study of man. Chicago: University of Chicago Press, 1959.

Poteet, J. Behavior modification: A practical guide for teachers. Minneapolis, Minnesota: Burgess, 1973.

Premack, D. Reinforcement theory. In. D. LeVine (Ed.), Nebraska symposium on motivation. Lincoln, Nebraska: University of Nebraska Press, 1965.

Prugh, D. G., Engel, M., & Morse, W. C. Emotional disturbance in children. In N. Hobbs (Ed.), Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

Pulaski, M. A. S. Understanding Piaget: An introduction to children's cognitive development. New York: Harper & Row, 1980.

Quay, H. Some basic considerations in the education of emotionally disturbed children. Exceptional Children, 1963, 30, 27-31.

Ramp, E., & Hopkins, B. (Eds.). A new direction for education: Behavior analysis. Lawrence, Kansas: University of Kansas, 1971.

Reid, D. K. Genevan theory and the education of exceptional children. In J. M. Gallagher, & J. A. Easley, Jr. (Eds.), Knowledge and development (Vol. 2). New York: Plenum Press, 1978. (a)

Reid, D. K. Learning and development from a Piagetian perspective: The exceptional child. Proceedings of the eighth annual conference on Piagetian theory and the helping professions. Los Angeles, California, 1978. (b)

Reid, D. K. Toward an explication of developmental epistemology in the education of exceptional children. Proceedings of the eighth annual conference on Piagetian theory and the helping professions. Los Angeles, California, 1978. (c)

Reid, D. K. Equilibrium and learning. Boston University Journal of Education, 1979, 161(1), 51-71.

Rhodes, W. C., & Paul, J. L. Emotionally disturbed and deviant children: New views and approaches. Englewood Cliffs, New Jersey: Prentice-Hall, 1978.

Richmond, P. G. An introduction to Piaget. New York: Basic Books, 1970.

Riegel, K. F. Psychology mon amour: A countertext. Boston: Houghton Mifflin, 1978.

Robinson, D. N. An intellectual history of psychology. New York: MacMillan, 1976.

Robinson, D. N. Systems of modern psychology: A critical study. New York: Columbia University Press, 1979.

Rubin, K. H. Egocentrism in childhood: A unitary construct? Child Development, 1973, 44, 102-110.

Safford, P. O. Teaching young children with special needs. St. Louis: C. V. Mosby, 1978.

Samples, B., Charles, C., & Barnhart, D. The wholeschool book: Teaching and learning late in the twentieth century. Reading, Massachusetts: Addison-Wesley, 1977.

Schultz, E., Hirshoren, A., Manton, A., & Henderson, R. Special education for the emotionally disturbed. Exceptional Children, 1971, 38, 313-320.

Schmid-Kitsikis, E. Piagetian theory and its approach to psychopathology. American Journal of Mental Deficiency, 1973, 77(6), 694-705.

Schmid-Kitsikis, E. The cognitive mechanisms underlying problem-solving in psychotic and mentally retarded children. In B. Inhelder, & H. H. Chipman (Eds.), Piaget and his school: A reader in developmental psychology. New York: Springer-Verlag, 1976.

Scriven, M. Views of human nature. In T. W. Wann (Ed.), Behaviorism and phenomenology. Chicago: University of Chicago Press, 1964.

Scriven, M. The philosophy of behavioral modification. Behavior modification in education: The seventy-second yearbook of the National Society for the Study of

Education, Part I. Chicago: The University of Chicago Press, 1973.

Segal, E., & Lachman, R. Complex behavior of higher mental process. American Psychologist, 1972, 27(1), 46-55.

Seligman, M. E. P. On the generality of the laws of learning. Psychological Review, 1970, 77, 406-418.

Serafica, F. C. Object concept in deviant children. American Journal of Orthopsychiatry, 1971, 41, 473-482.

Sexton, V. S. American psychology and philosophy, 1876-1976: Alienation and reconciliation. The Journal of General Psychology, 1978, 99, 3-18.

Sharan, S. Cooperative learning in small groups. Review of Educational Research, 1980, 50, 241-271.

Shea, T. M. Teaching children and youth with behavior disorders. St. Louis: C. V. Mosby, 1978.

Simeonsson, R. J., Grunewald, K., & Scheiner, A. Normalization and Piagetian theory. In R. Weizmann, R. Brown, P. Levinson, & P. A. Taylor (Eds.), Piagetian theory and the helping professions (Vol. 1). Los Angeles: University of Southern California, 1977.

Skinner, B. F. Behavior of organisms. New York: Appleton-Century-Crofts, 1938.

Skinner, B. F. Walden II. New York: MacMillan, 1948.

Skinner, B. F. Are theories of learning necessary? Psychological Review, 1950, 57, 193-216.

Skinner, B. F. Science and human behavior. New York: MacMillan, 1953.

Skinner, B. F. Cummulative record. New York: Appleton-Century-Crofts, 1959.

Skinner, B. F. The technology of teaching. New York: Appleton-Century-Crofts, 1968.

Skinner, B. F. Beyond freedom and dignity. New York: Knopf, 1971.

Skinner, B. F. Some implications of making education more efficient. Behavior modification in education: The

seventy-second yearbook of the National Society for the Study of Education, Part I. Chicago: The University of Chicago Press, 1973.

Slavin, R. Cooperative Learning. Review of Educational Research, 1980, 50, 315-342.

Spence, K. W. A theory of emotionally based drive and its relation to performance in simple learning situations. American Psychologist, 1958, 13, 131-141.

Spodek, B., & Wolberg, H. J. (Eds.). Studies in open education. New York: Shocken Books, 1975.

Stallings, J. Implementation and child effects of teaching practices in follow through classrooms. Monographs of the Society for Research in Child Development, 1976 (Serial No. 163).

Suchotliff, L. C. Relation of formal thought disorder to the communication deficit in schizophrenia. Journal of Abnormal Psychology, 1970, 76, 250-257.

Swanson, H. L., & Reinert, H. R. Teaching strategies for children in conflict. St. Louis: C. V. Mosby, 1979.

Swap, S. Disturbing classroom behaviors: A developmental and ecological view. Exceptional Children, 1974, 41, 163-172.

Taylor, J. A. Drive theory and manifest anxiety. Psychological Bulletin, 1956, 303-321.

Thomas, L. The medusa and the snail. New York: The Viking Press, 1974.

Thorndike, E. L. Educational psychology. New York: Columbia University Press, 1913.

Thorndike, E. L. Animal intelligence. New York: Hafner, 1970. (Facsimile of 1898 ed.)

Tuma, D. T. (Ed.). Problem solving and education: Issues in teaching and research. New York: Halsted, 1980.

Ullmann, L., & Krasner, L. (Eds.). Case studies in behavior modification. New York: Holt, Rinehart and Winston, 1965.

Ullmann, L., & Krasner, L. <u>Psychological approaches to abnormal behavior</u> (2nd ed.). Englewood Cliffs, New Jersey: Prentice-Hall, 1975.

U. S. Office of Education. <u>Estimated number of handicapped children in the United States, 1974/75</u>. Washington, D. C.: Bureau of Education of the Handicapped, 1975.

Voyat, G. Psychosis: A cognitive and psychodynamic perspective. <u>Proceedings of the eighth annual interdisciplinary conference on Piagetian theory and the helping professions</u>. Los Angeles: University of Southern California, 1978.

Watson, J., & Rayner, R. Conditioned emotional reactions. <u>Journal of Experimental Psychology</u>, 1920, <u>3</u>, 1-14.

Wedell, K. (Ed.). <u>Orientations in special education</u>. New York: Wiley, 1975.

Wehman, P., Abramson, M., & Norman, C. Transfer of training in behavior modification programs: An evaluative review. <u>The Journal of Special Education</u>, 1977, <u>11</u>(2), 217-231.

White, R. W. Motivation reconsidered: The concept of competence. In I. J. Gordon (Ed.), <u>Human development: Readings in research</u>. Glenview, Illinois: Scott, Foresman, 1965.

Wolff, P. H. Piaget and mental health. In F. B. Murray (Ed.), <u>The impact of Piagetian theory</u>. Baltimore: University Park Press, 1979.

Wolman, B. B. <u>Contempory theories and systems in psychology</u> (2nd ed.). New York: Plenum Press, 1981.

Wood, F. H. Behavior modification techniques in context. <u>Newsletter for the Council for Children with Behavioral Disorders</u>, 1968, 5(4), 12-15.

Wyne, M. D., & O'Connor, P. D. <u>Exceptional children: A developmental view</u>. Lexington, Massachusetts: Heath, 1979.

Zelniker, T., & Wendell, J. E. Reflective and impulsive children: Strategies of information processing underlying differences in problem solving. <u>Monographs of the Society for Research in Child Development</u> 1976, <u>41</u> (5, Serial No. 168).

Zern, D. S., Kenney, H. J., & Kvaraceus, W. C. The cognitive style dimension of reflectivity-impulsivity in normal and emotionally disturbed adolescents. Journal of Genetic Psychology, 1977, 131(1), 107-113.