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Suggestions for direct experiences with children to support exploration of cognitive-developmental theory by teachers.

Richard Alan Welles
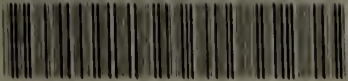*University of Massachusetts Amherst*

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SUGGESTIONS FOR DIRECT EXPERIENCES
WITH CHILDREN TO SUPPORT EXPLORATION
OF COGNITIVE-DEVELOPMENTAL THEORY BY TEACHERS

A Dissertation Presented

By

Richard A. Welles

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

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Education

SUGGESTIONS FOR DIRECT EXPERIENCES
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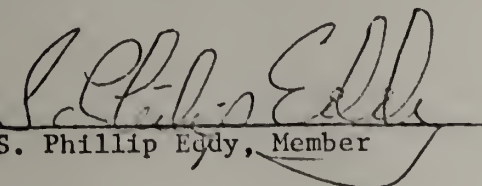

A Dissertation

By

Richard A. Welles

Approved as to style and content by:

_____
Klaus Schultz, Chairperson of Committee

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S. Phillip Eddy, Member

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Thomas Roeper, Member

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Mario Fantini

Dean

School of Education

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ABSTRACT

Suggestions for Direct Experiences
with Children to Support Exploration
of Cognitive-Developmental Theory by Teachers

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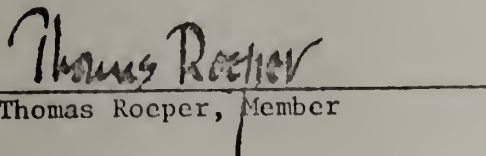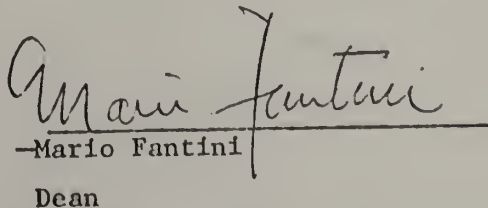Richard A. Welles, B.A., Tufts University

Ed.D., University of Massachusetts

Directed by: Dr. Klaus Schultz

The purpose of the dissertation is to suggest ways to make accessible to teachers the stream of thinking about development and education associated with John Dewey and Jean Piaget. The approach developed in the study emphasizes teachers undertaking direct experiences with children as the key to their reflection on the theory and its implications for their work.

Chapter I identifies the problem area and recognizes the open education movement as a reservoir of experience for the dissertation. Additionally, the central and neglected importance of teachers' beliefs in effecting lasting change is discussed.

Chapter II outlines the interactional position on development and discusses some educational implications. Two central features of the theory are identified: (1) adults and children differ in structurally significant ways, and (2) the mechanism of growth is self-regulation as a consequence

of person-environment transaction. Terms are defined and discussed, and the personal and changing nature of knowledge is emphasized.

Chapter III illustrates the key theoretical features identified previously. Sixteen (16) episodes of children's activities are presented and analyzed as illustrations of various theoretical principles. A discussion of the teacher's role as provider and provoker is presented and discussed. The importance of observation and reflection as bases for professional decisions provides a conclusion to the chapter.

Chapter IV describes thirty-four (34) simple experiments teachers can elect to undertake with children in their classrooms. Included are inquiries into both general and specific issues of pedagogical concern. Discussion is included on how to administer, interpret and adapt experiments as a teacher directs and informs his/her exploration of the theory. Additionally, six (6) plans are outlined to suggest different contexts and foci for using and adapting the suggested experiment structures.

Chapter V concludes the dissertation with a summary and suggestions for further inquiry. Also, specific mention is made of conditions and other guidelines for supporting the inquiring teacher. Recommendations for further work emphasize school-based, teacher-directed developments needed, implying an increased professionalization of education.

Thus, this dissertation identifies experience structures and processes as means and directions for teachers to undertake an exploration of educational implications of interactional developmental theory.

CONTENTS

CHAPTER I

> The potential contribution of developmental
> psychology goes far beyond the presentation of a
> useful bundle of facts on child behavior. The
> basic findings of recent developmental psychology
> are, in fact, <u>revolutionary</u> because, <u>once</u>
> <u>understood</u>, they redefine the school's aims and
> its methods for meeting these aims. The
> revolution, however, is really Dewey's old
> revolution that never took place in the thirties.
> (Kohlberg, 1973, p. 1, emphasis added)

Introduction and Statement of the Problem

This dissertation addresses the problem of making the

stream of thinking about development and education associated

with Dewey and Piaget an important influence on schooling.

In seeking to connect a theory with educational practice,

this study will be concerned with defining, describing and

applying theoretical concepts in a manner that makes them

accessible to concrete experience and that directly addresses

concerns of the teacher practitioner. Further, the study

will suggest direct experiences a teacher can undertake in

order to explore the theory and its significance for his or

her professional behavior. The approach developed in this

dissertation emphasizes teachers' undertaking direct

experiences with children as the key to their reflection on

theory and its implications.

The dissertation, then, is about one stream of

educational thought and about methods for fostering teachers'

understanding of its major features. Cognitive-developmental
education (Kohlberg, 1973) is accepted in this dissertation
as worthy of inquiry by teachers. Other authors address the
issues of truth related to this theory and will be mentioned
as appropriate. The question addressed in the pages that
follow is: If the cognitive-developmental ideology has valid
implications for educational practice, how can teachers come
to hold and come to use them in their teaching? Stated
somewhat differently: how can teachers explore the degree to
which aspects of the theory are appropriate to their teaching
and to the children with whom they work?

Rationale

Efforts to identify and bridge gaps between theory and
practice are common in educational literature and include
general surveys, specific presentations of particular
persuasions, and discussions of focused topics. Indeed, the
profession seems eager to build or rebuild practices
consistent with new statements of theory as they appear.
Bloomings of articles, books and materials connecting ideas
with desired or real activities have appeared relatively soon
after the advent of theories concerning transactional
analysis and after the latest surge of the feminist movement,
for example. There is no dearth of literature attempting to
link the ideas of Dewey or Piaget to educational practices.

Although the need and desire to interrelate theory and practice is well established and intense effort is applied to the task, success is elusive. This seems especially true from the perspective of the classroom teacher. Children are complex beings, and the conditions that affect their actions and development are diverse and often change. The worth of articles, advice, kits, tests, norms, pressures and models must be balanced and clarified in light of ideas, of experience and of the children at hand.

Conventionally, teachers try to understand educational theory by first reading about theory and then trying to build their own applications. There are usually enormous disparities between the conditions under which the theoretical statements are encountered on the one hand and the conditions under which the practical manifestations are sought on the other. The translations teachers can manage to make from the bookstore or from the university library and seminar room to their school classrooms are usually fuzzy at best and often distortions of the theoretical ideas.

The author assumes that a major factor governing teachers' likelihood of understanding theoretical principles is the extent to which they witness elements of the theory in living situations. For teachers, such understanding depends on the degree to which the theory appears operative or real in their classrooms.

This dissertation seeks to provide tools for helping teachers gain direct experience with interactional theory while it is being studied. In the final analysis, no substitute yet exists for close reading and reflection on the theoretical literature. What is needed are ways to enhance the possibilities of teachers ever undertaking such study and ways to complement such inquiry with the study of ongoing classroom life.

The purpose of this dissertation, then, is to find ways to help teachers:

- make meaningful purchase in interactional developmental theory; and

- generate information for determining the significance of aspects of the theory for their teaching.

The dissertation describes the key role of the teacher in making effective change (Chapter I). The dissertation identifies key features and implications of the theory from the perspective of the classroom (Chapter II). Chapter III gives and discusses several illustrations of those features. Chapter IV describes several activities teachers can undertake to explore the theory. Chapter V identifies implications of the discussion and methods presented for teacher education and suggests directions for future work.

In articulating conditions and experiences to foster teachers' learning about cognitive developmental or interactional theory, the author has attempted to use the

theory itself for guidance as to method. Both Piaget (in
Hapgood, 1976, for example) and Dewey (1916, 1933, and in
Mayhew and Edwards, 1936) have emphasized that learning about
their ideas requires that teachers be active inquirers. As
Dewey (1916) summarizes:

> no thought, no idea, can possibly be
> conveyed as an idea from one person to another.
> When it is told, it is, to the one to whom it is
> told, another given fact, not an idea. The
> communication may stimulate the other person to
> realize the question for himself and to think out
> a like idea, or it may smother his intellectual
> interest and smother his dawning effort at
> thought. But what he directly gets cannot be an
> idea. Only by wrestling with the conditions of
> the problem at first hand, seeking and finding
> his own way out, does he think.
>
> (pp. 159-160)

Limitations

The author recognizes the problem that acceptance of
the interactional theory in the dissertation presents by
opening all of child development to investigation. Teachers
might be tempted to think that the claim is that interaction
explains in fact the origins and nature of all change. This
overgeneralization is dangerous both in that such
universality is not proven and likely cannot be and in that
it invites either blind acceptance or rejection by teachers.
Such is not the claim or the intent.

Rather, the author recognizes that the interactional
theory provides most basically one metaphor or method for
thinking about phenomena. It contributes to our

understanding by helping us generate useful hypotheses and by providing compelling explanations for <u>some</u> aspects of growth. Perhaps the most professionally useful aspect of the dissertation is not so much the acceptance (or rejection) of interactional theory which it may occasion in teachers as it is simply the presentation of methods and expectations for close observation and reflection it suggests for teachers.

Teachers should be encouraged to entertain alternative explanations for the phenomena generated during the experiences suggested in the dissertation. Teachers should be cautioned against employing or devising educational implications unless they have found supportive evidence.

Open Education as a Resource for the Dissertation

The author takes a major challenge in American education to be helping the nature of schooling, the actions of teachers, and the experiences of children to reflect more intentionally the aims and implications of the cognitive-developmental ideology. This theory is most closely identified with the work of John Dewey and of Jean Piaget and his collaborators and is linked to the open education movement* in England and in the United States.

Education sections of bookstores are stocked with testimonials, case histories, guidelines, resource

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*Also termed integrated day, informal classroom, and British Infant model.

directories and inventories for open classrooms. A burgeoning cornucopia of kits, handbooks, checklists, workshops, college courses, conferences, centers, programs, advocates, elders and authorities can be loosely grouped as part of something called open education. Considerable effort has gone into describing and defining the open education approach to schooling. Some efforts resemble articles of faith and are clear attempts to justify and distinguish a movement <u>against</u> conventional practices (Barth, 1971; Featherstone, 1971; Walberg and Thomas, 1972). They are energized against what Silberman (1971) so acidly called the "mindlessness" of schooling. They read, in fact, much like John Dewey's florid 'Pedagogic Creed' (1897).

Recently, other educators have undertaken more balanced efforts to analyse and articulate what open education is and is not (Bussis and Chittenden, 1970.; Mai, 1974). The press for open educators to understand, explain, and justify what they are about has also led to related work on new concepts and processes of evaluation to cope with the new demands of informal education (Carini, 1973; Bussis, Chittenden, and Amarel, 1974; Molony, 1974).

For the purposes of this dissertation (those of connecting theory with the professional experiences of teachers), open education will be modestly conceived as a process of seeking more effective ways of educating children with the theory as one source of guidance.

In contrast to copying a model for open education (which does not exist), Jenny Andrae (1973) emphasizes the dynamic quality involved:

> For me, opening education or opening a classroom is more accurate than open education or open classroom. Open implies something that is complete or finalized whereas opening implies growth.
>
> (p. 463)

Lillian Weber (1972), one of those closest to the cutting edge of connecting theory and practice in 'opening education,' describes the direction of her intensive work with teachers in New York public schools over several years:

> No ideal conception of open education or integrated day is operative for us. Our goal is to better support children's learning than has been the case in compulsory education in the past and to produce a better match between school structure and what we know of how a child learns.
>
> (p. 72)

The crucial factor is the thrust toward developing teachers' understandings tempered by the recognition "that our success is partial, that the descriptive word for our efforts is 'toward'" (Weber, 1972, p. 72). The efforts of these and other pioneers will help guide this study in recommending ways to connect teachers with interactional theory.

Dimensions of the Problem

The record of efforts to change schools significantly and to build in the influences suggested above is not encouraging. New practices developed by educators present other educators the means to alter the surface structure of

their classrooms. Although many of the innovations in the comparatively young institution of mass education have had the effect of changing the appearance of schools, the degree to which they have affected the lives of children seems less definite (Jencks, 1972). Team-teaching, flexible scheduling, middle schools, open-space buildings, nongradedness, regionalization, multi-age grouping, and many others have been examined and often instituted in the same manner as options on a new automobile. Often shiny with publicity, relatively easy to extoll and implement, apparently able to solve old problems, they have been bought and stuck on to a fundamentally unchanged school structure (Bruner, 1970; Fantini, 1970).

The root of the problem is clearly stated by Dewey (1946):

> The difference between educational practices that are influenced by a well-thought-out philosophy, and practices that are not so influenced is that between education conducted with some clear idea of the ends in the way of ruling attitudes of desire and purpose that are to be created, and an education that is conducted blindly, under the control of customs and traditions that have not been examined or in response to immediate social pressures.
> (pp. 165-6)

Although many schools can display new hardware, changes that are fundamental are much more difficult to find or accomplish. The impact that opening education can have on schooling depends on re-forming many of the most established beliefs, attitudes and values that control the nature of

school experiences. Encouragingly, J. McVicker Hunt (1969),

in surveying recent developments in psychology, suggests:

> Some of our most important beliefs about man and
> his development have changed or are in the
> process of changing.   .
>
> (p. 2)

Some of the fundamental beliefs he finds to be losing

influence are the doctrines of fixed intelligence, of pre-

determined development, and of behavior being motivated

primarily by pain and bodily need. The quality and rate of

pedagogical response to these important developments in

theorists' understandings, however, even if the latter are as

clear as Hunt suggests, is questionable.*

There is a strong tradition in social sciences that

supports giving significant attention to what a teacher

believes as well as to how the teacher acts (Rokeach, 1960,

1970; Kelly, 1955; Harvey, Hunt, and Schroeder, 1961; Bussis,

Chillenden and Amarel, 1974). Sarason (1971) shows, in a

distinguished effort, new ways to understand and reflect upon

the beliefs as they reveal themselves in school habits.

The subject of this dissertation, then, is the process

of beginning to build different habits that would have the

consequence of schools changed in appearance probably, but in

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*Kindergartens still do not exist for over one-third of
American children fifty or more years after this relatively
simple change was introduced, in spite of impressive
theoretical support. (Comments by the president of the
National Education Association, February, 1975).

substance as well. The goal is not a package or blueprint, but rather a structure for developing different ways of thinking about children and adults and for developing different approaches for working together than are usually in evidence in schools. One critical part of bringing about this transformation of schooling would be helping teachers experience and identify manifestations of theory in their daily professional lives.

Aristotle said, in concert with the social concepts prevailing in his time, that slavery existed by nature. He was sure that masterly and slavish roles were inherent and determined by nature. It would be foolish and idle, in his view, and do violence to human nature and society, to try to set people adrift from their natures. Clearly, unexamined assumptions can inhibit change. This dissertation addresses how to provide mechanisms which encourage intelligent reconsideration of assumptions by teachers. Chapters II and III report on the basic tenets of the interactional theory and some of the "revolutionary" implications for education while Chapters IV and V describe evolutionary methods for teacher education.

Teachers and Theory

Educational practices that do not along the way develop a clear, comprehensive and unified theoretical foundation are prone to fragmentation and distortion. Cremin (1961) has

described the course of dissipation of the progressive
education movement. Indications are that open education may
be similarly destined unless convincing connections of theory
and practice develop (Carini, 1972; Mai, 1974). Of course,
Dewey (1946) recognized the problem and commented that many
progressive schools were chaotic, uncontrolled and "just
messing around or doing a little of this and a little of that
in the hopes that things would get better." Roland Barth
(1973), once an ardent advocate of open education, is now
counseling moderation and the need for guidance by
principles, cautioning that: "We need no more failures, even
in the name of reform."

Opening education is an arduous, continual process,
often involving educators in relinquishing power as much as
in acquiring new power. Although many teachers have been
willing to share the course of their progress with others, it
is crucial to recognize in their accounts how personal is the
process. Some people are impressed with (or dismayed by) the
surface structure of an informal classroom - the materials,
schedules, use of space, and the movement. Lillian Weber
(1972) warns that these are often only the barest beginnings
whose significance lies in the direction the teachers
involved are going as well as where they have come as
individuals and as members of groups. She notes:

> It is these partial implementations that visitors
> see and examine and sometimes imitate without the
> test of reference back to their functional status

regarding better match. But it is clear by now
that the implementations create only the
<u>possibility</u> for support of individual and
actively selective patterns of learning, only the
<u>possibility</u> for support of interest and an
interaction of points of view.

<div align="right">(p. 65)</div>

The search for building more productive ways to

facilitate significant change in schools called for by Rubin

(1972) must consider perceptions and needs of teachers and

the necessity for supporting teachers' reorganization of

their basic beliefs. Often, teachers have been regarded as

incompetent and too muddle-headed to create solutions to

problems of the schools and barely able to do a decent job of

putting someone else's ideas into practice. That attitude

has been unproductive. Goodlad (1974) described how the

development of programs from the outside to be introduced in

classrooms has failed, especially in the last two decades.

Bruner (1970), looking back on the response to the Woods Hole

Conference, his <u>Process of Education</u>, and the curriculum

efforts that were spawned, writes:

> The acclaim from which we suffered was that
> each reader-teacher picked the part he liked best
> and proclaimed it was exactly what <u>he</u> was doing.
> <div align="right">(p. 20)</div>

Similarly, Wolf and Fiorino (1973) made an intensive study of

recent adoptions of changes in schools and report that

"although the majority of educators seem interested in

improving their practices," (p. 92), changes were made or not

made based on their reliance on what they 'knew' to be true;

that is, actions were dependent on beliefs. Bussis,
Chittenden, and Amarel (1974) further underline the critical
role of the teacher and prospects for the course of change:

> ...it seems fairly clear by now that elementary
> education in this country is not going to be
> changed by curricula that are teacher-proof (the
> over-whelming evidence suggests that there is no
> such thing)--nor can we expect suddenly to have
> our schools staffed exclusively by high-powered,
> exceptional human beings.
>
> (p. 5)

Conditions vary greatly in our schools, more so than is
often supposed (Rubin, 1972; Goodlad, 1974). However, it
seems to be the teacher and the teacher's conceptions that
are the key to determining what occurs and what does not
occur. Joyce and Harootunian (1974) found that the kind and
extent of the teacher's thinking was a more important
determiner of classroom climate than even the kind and extent
of teacher-pupil interactions. So a process of change that
influences a teacher's thinking is necessary and likely to
influence what occurs in the classroom. Teachers are acting
and will continue to act on what they 'know' to be true.*

At the same time, many of the available ways for
teachers to encounter different educational thinking are
ineffective. Pre-service experiences with psychology and

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*The author acknowledges that many teachers say that they are
not permitted to implement practices that they believe to be
needed. Obviously, these issues of power are related to the
topic of this study and should be addressed in any program of
planned change built on the recommendations made in this
dissertation.

philosophy occur separate from significant tests of
responsibilities for growth of children. Inservice
experiences frequently suffer from gaps between the on-going
classroom reality and the theory involved..

Usually, methods to explore theory are written. The
major portion of the literature on human development and
epistemology is not intended for practitioners. Descriptions
and elaborations of theory and evidence include complex,
comprehensive statements, forcefully written. The literature
reveals complicated debates on various fundamental
assumptions about man and nature and growth, e.g., humanists
vs. behaviorists, innatists vs. environmentalists,
intuitionists vs. rationalists. Frequently, the terms and
procedures are private or highly technical. Connection of
theory to a variety of settings is often incomplete or
ignored. (Piaget's writing, for example, has justly
occasioned such comments.)

The voluminous, uneven body of research, theorizing,
speculation, and argument in educational theory has given
rise to middle agencies attempting to interpret implications
into responses to educational settings. Among the goals of
such curriculum specialists, teacher education institutions,
textbook and materials producers has been, in Dewey's phrase
(1900), to "secure a translation of large words and ideas
into specific images". The position taken here is that such
efforts can produce at best second-hand understanding from

the perspective of the teacher, in the absence of more direct contact. The result is that teachers are urged and perhaps forced into action in new directions with inadequately perceived rationale to guide and inform their work.

Again, Dewey (1895) is clear on the direction for next steps:

> To the educator...the only solid ground of assurance that he is not setting up impossible or artificial aims, that he is not using ineffective and perverting methods, is a clear and definite knowledge of the normal end and the normal forms of mental action.
>
> (p. 198)

Directions for Teacher Growth

Although it is certainly possible, and perhaps even useful, to denigrate schools and teachers as ineffectual, anti-intellectual, and "mindless" (Silberman, 1971; Jencks, 1972; Illich, 1971), this author prefers to recognize high standards of aspiration in the profession. Myers and Torrance (1970), discussing research which describes teachers being by nature resistant to change, ask whether such characteristics may arise out of experiences which teachers encounter in the profession. Given the central role of the teacher, the confusing and conflicting bodies of theory, the press for excellence, and the prudence of making powerful connections between theory and practice, what should characterize experiences designed to help teachers change?

The approach taken in this dissertation assumes and emphasizes the personal ownership of growth experiences. Rogers (1958) describes the importance of this focus:

> The only kind of learning which significantly influences behavior is self-discovered or self-appropriated learning--truth that has been personally appropriated and assimilated in experience.
>
> (pp. 4-5)

In recognizing the personal nature of learning, the conditions of teacher education efforts need also to value, foster and lead to experiences that are educative following Dewey's (1916) guideline and definition. Growth experiences are recognizable by

> ...a constant reorganizing or reconstruction of experience...which adds to the meaning of experience and which increases ability to direct the course of subsequent experience.
>
> (pp. 89-90)

Part of the reason that the concrete materials associated with opening education have been adopted by many teachers is that with them children display more readily how they actually think. Witnessing children's thinking in these ways contributes to teachers' rebuilding their own thinking. James Moffitt (1968), who has done important work in building powerful language experiences for children, describes the redirection:

> In moving outward from himself, the child becomes more himself. The teacher's art is to move with this movement, a subtle act possible only if he shifts his gaze from the subject to the learner.
>
> (p. 6)

Although no one ought to be sanguine about the ease of rebuilding schools by means of teachers' reorganizing their concepts of what should occur, first steps must include recognizing the teacher's essential role. All the other conditions and implications for fostering change in schools depend on the will and courage and energy of teachers. Lillian Weber (1972) is particularly clear on the import of the teacher and his/her beliefs:

> Only...conviction of the necessity for change can give them the energy and courage to sustain the anxiety of public change, to risk (a)s their analysis of an existing but heretofore unrecognized poor match becomes conscious and clear, teachers will begin to change...
>
> (p. 66)

This dissertation suggests ways for teachers to acquire, develop and nourish "the conviction of necessity" that will guide the difficult efforts of teachers "to modify actions in accordance with...intelligence" (Weber, p. 67).

Descriptions of Chapters

CHAPTER II: The Interactional Theory

This chapter describes the theory of human development that Kohlberg (1973) terms cognitive-philosophical or interactional. This theory holds that knowledge and development in people stem from the quality of interaction between the individual's endowment and the environment, yielding the individual's construction of meaning in consequence. Major reference will be to the work of John

Dewey and Jean Piaget. In addition, interpretations and contributions of others, including Kohlberg, will be used. The chapter will identify major questions the theory addresses and describe the answers that have developed. Particular attention will be given to identifying and describing issues that directly relate to the teacher's role such as necessity for consequence and the role of social interaction.

CHAPTER III: Illustrations and Implications

This chapter sharpens the description of the theory by illustrating some key features identified. Records of children's actions are included and discussed in terms of features of the theory. In addition, questions of pedagogical significance raised by the examples and discussions are addressed. The examples are drawn from the author's observations and from published accounts, primarily those of Piaget and Patricia Carini.

CHAPTER IV: Experiences for Teachers

This chapter presents a number of experiences teachers can undertake to explore and expand their understanding of the interactional theory and the significance of the theory and methods it implies in terms of children with whom they work. Observation tasks and questions to ask oneself are presented, as well as experiments to carry out with children. Included are ways to explore both general aspects of the

theory - such as ego-centrism and the importance of concrete experiences - and ways to investigate some specific areas - such as a child's concept of number. Additional discussion of educational implications concludes the.chapter.

CHAPTER V: Summary and Implications

This chapter summarizes the approach and findings of the dissertation. Implications are drawn for the character of preservice and inservice teacher education experiences. Specific directions for further inquiry into the suggestions of the dissertation are identified.

CHAPTER II

THE INTERACTIONAL THEORY

The branch of developmental thinking herein discussed
is called cognitive-developmental or interactional (Kohlberg
and Mayer, 1972). The approach is based in the major
theoretical work of John Dewey and Jean Piaget and has as its
premise that development emerges from the interaction between
the child and the environment.* In contrast to views which
regard internal genetic and maturational forces or external
environmental conditions as primarily responsible for
development, the interactional position, as summarized by
Kohlberg (1973), identifies development as

> neither direct biological maturation nor direct
> learning...but a reorganization of psychological
> structures resulting from organismic-
> environmental interactions.
> (p. 3)

Different conclusions and recommendations are drawn
about the appropriate conduct of schooling based partially on
differing convictions about the nature of human development
and the consequent proper roles for those who would influence
growth. The task of this chapter is to outline the

_____

*This dissertation is primarily concerned with issues about
development in the early childhood/elementary school age
child, although the basic concepts, implications and approach
discussed have general application.

interactional position and to explore some educational implications. Later chapters discuss specific concerns educators might raise concerning the theory and suggest methods educators can undertake to explore the usefulness of this theory for their professional conduct.

First, a brief overview is presented. The discussion of the theory continues by identifying two central features of the interactional theory which are basic to both the thrust of the theory and to building implications for educational practice. The two central principles are: (1) adults and children are different in significant ways, and (2) autoregulation as a result of experience is the major mechanism of development. The chapter concludes with brief applications of the central principles to the two educational concerns of language and social environment.

Overview

The concept of development refers to the process by which characteristics of living things change from those of one state or structure to those of another. The term is usually restricted to discussions of changes deemed fundamental and inferred from observations and analyses of behavior. Nagel (1957) in discussing these connotations of development identifies two central assumptions:

> the notion of a system possessing a definite
> structure and a definite set of pre-existing
> capacities; and the notion of a sequential set of
> changes in the system, yielding relatively

permanent but novel increments not only in its
structure but in its modes of operation as well.
(p. 17)

In normal circumstances, then, development is orderly

(Werner, 1957). In general, theories about human development

endeavor to explain the process of moving from infancy to

adulthood. In a sense, such work synthesizes the various

evolving branches of psychology and incorporates findings and

methods from other inquiries in philosophy, biology, and

mathematics, for examples. It is no surprise that there is

little agreement on the nature of development in humans or on

the relative roles and importance of various factors thought

to influence intellectual and social development.*

The Nature of Development for the Interactionists

Development from the interactional persepctive, that

is, change in the person's organization of experience, is

conceived as occurring within a system consisting of the

person who acts upon and responds to his/her environment.

Development is discerned in major alterations in the person's

ways of acting and responding. As described by Dewey (1916),

organic life is

a process of activity that involves an
environment. It is a transaction extending
beyond the spacial limits of the organism. An
organism does not live in an environment; it
lives by means of an environment.
(p. 25)

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*There does appear to be somewhat less controversy
surrounding physiological development and its reliance on
genetic and nutritional factors.

In terms of development, the important elements must be attended to simultaneously; they include: the current characteristics of the particular person, activity or purposeful behavior occurring, and influential factors in the situation. The elements are interconnected and interacting.

Although some other factors are acknowledged to have influence on the course of an individual's development,* the interactional position assigns the key responsibility for the course of development in the individual to a process called mental adaptation or equilibration.

The variables important to the interactionist position on the nature of developmental processes derive from the view of life as characterized by organization and adaptation. That is, on the individual level, there is a premise of a coherent entity continually striving toward adequate balance internally and within its milieu. For individuals who survive, there is a tendency toward becoming more and more effective (Piaget, 1952). The organism thus evidences "a mechanism that responds both to variations that occur within the organism and in surroundings" (p. 38). These are terms and concepts borrowed from biology. The uniquely human examples of organization and adaptation called intelligence (ethics, logic and language, as examples) are revealed to the

*Chiefly, some outside limits are thought to be imposed by genetic endowment. Also, some rough timing limits have been suggested to be due to normal neurological and physical maturation.

interactionists functionally; in the quality of the
individual's actions within his/her environment. In
particular, the theory is concerned with the forms and
expressions of meaningful purpose the person willingly and
spontaneously displays. Piaget (1952) states that
intelligence seen as a process is the fundamental aspect of
development:

> To say that intelligence is a particular instance
> of biological adaptation is thus to suppose that
> it is essentially an organization and that its
> function is to structure the universe....The
> organism adapts itself by materially constructing
> new forms...intelligence extends the creation by
> constructing mental structures which can be
> applied to those of the environment.
>
> (pp. 3-4)

Thus, for the interactionists, what develops are the
structures or forms for understanding employed to attain and
maintain harmony. The content of actions change while the
function of intelligent adaptation remains constant.

Child/Adult Differences

In their studies of children, adolescents and adults,
interactionists have found that basic beliefs about reality
and the tools and concepts available for the individual's
general use in daily living undergo radical transformations
during the person's life. Over the course of years, a person
displays and employs confidently different conceptions of
causality, of morality, of subjective and objective, and of
the nature of various properties (number, area, volume,

weight, as examples). Chapter III contains some
illustrations of different conceptions of children. Many of
these qualitative changes in belief occur normally in
childhood and are important to educators both in their coming
to understand the children with whom they work and in their
planning of educational aims and environments. This issue is
discussed later in the chapter in relation to the topic of
differences in child and adult thought.

Following is a brief description of the process of
equilibration. Combined with the above, it serves as a
screen for identifying features of the theory which have
particular educational significance.

Equilibration

The interactionist theory accounts for development as
arising from resolutions of imbalances in the connections
between the person and the environment. For example, the
infant acts by means of certain inborn or perhaps pre-natally
developed "tendencies" (Dewey, 1916) or "instincts" (Piaget,
1952), such as sucking and attraction to light. Variations
in situation (e.g., position of the breast, intensity of
light) in connection with activity lead to similarities and
differences in consequences which the infant seeks to control
by linking new experiences with old actions and
understandings. At that point, development may be revealed
by new capacities for acting, new knowledge the infant has

constructed. The infant may only begin sucking motions when hearing Mother's voice and not Father's, for example.

The person is constantly resolving responses arising during activity with predictions and interpretations s/he makes. This is part of the normal course of living, of acting to achieve goals, whether they be to satisfy hunger, be with a friend or to erect a block tower. Development occurs with and depends upon the individual's activity and experiences. At the same time, the nature of the person's experience and activities is determined in relation to his/ her structure and the impact that events have on his/her pursuit of present and future purposes (Dewey, 1938).

The dual direction of this process which Piaget calls equilibration involves the interplay of the complementary components of assimilation and accommodation. Assimilation is the aspect of balancing which occurs when an event, idea, or result is interpreted as confirming the individual's expectations and consistent with his/her concepts and organization of experience. Accommodation is the process which occurs when an event is interpreted as necessitating alteration in the person's understanding (Piaget, 1964). The two are separable only for analysis; in any experience both occur in a mixture depending on the interaction. Further discussion of equilibration occurs below in the section on experience.

In the following two sections, two basic features of the theory are identified and discussed as having major educational significance. The two features are: (1) the existence of significant differences between children and adults, and (2) the concept of experience. The primary role of equilibration will further focus the discussion.

Child/Adult Differences

According to the interactionists, there are important differences between children and adults in the area of quality of understanding. The child interprets events and interacts according to a personally-held system of convictions about reality which is differently constructed from that of adults.* Often, adults are tempted to interpret children's thinking as naive, insignificant, or unproductive. The interactionists take the child and his/her understanding very seriously. As Kohlberg (1966) summarizes:

> young children's responses represent not mere
> error but rather a spontaneous manner of thinking
> about the world that is qualitatively different
> from the way we adults think, and yet has a
> structure or logic of its own.
>
> (p. 5)

The basic approach is to the child as a functioning, organized being. Adults and children can and do interpret

_____

*The theory and research actually has found a sequence with several levels of children's organizations of reality. Exclusion of this elaborated feature does not distort the identification of fundamental differences between adult and child organizations of reality as a basic tenet.

the same events (e.g., a lesson's content or a snowball fight) very differently. Educators must learn how to shift focus from presenting and interpreting everything from the perspective of their own adult understanding to include regard for an action from the child's perspective. As Smock (1970) warns: "(u)ntil we do understand the principles underlying child thought, our innovations will not persist, will be neglected and misinterpreted and probably misused if used at all" (p. 28). One feature of the child's understanding as compared to that of the adult is often described as ego-centrism: for the child the meaning of objects, events and processes is closely linked to his/her personal needs and interests. Only gradually does the child develop a stable differentiation of himself/herself from events and objects. Throughout childhood, the child is developing an awareness of his own and others' purposes and perspectives and gradually becoming able to coordinate his/ her view with that of others. The differentiation or de-centering is through construction and reconstruction of serious beliefs which can give adults clues about what Werner (1957) called the child's 'sphere of reality'.

Some features of children's concepts about the world can be startling to adults and seem so ridiculous as to be ignored in thinking about curriculum. For example, Smock (1970) points out,

> Children fail to make a distinction between 'subjective' and 'objective'...it is not until the age of 6 or 7 that he (the child) begins to view physical dimensions and identity as unchangeable things that only appear to change under varying conditions.
>
> (pp. 29-30)

The limitations of some of the child's thinking, in particular the absence of ability to operate without concrete materials, or to focus very well on more than one aspect of a situation at a time, are difficult to credit for an adult, who is facile with language and abstraction in general. Werner (1960) describes some elements of the child's early beliefs:

> If the child believes that the wind and rain come out walking to pay him a visit or that the thunder roars to frighten him, or that the happenings of a play are aimed at him personally - in all such instances the egocentrism and 'nearness at hand' of all the spheres of his reality are apparent.
>
> (pp. 383-4)

Chapter III contains more examples of what and how children view themselves and their worlds. From an educational standpoint, in addition to a recognition that the child has a meaningful 'sphere of reality,' it is necessary to have a firmly held conviction on how the child relinquishes what s/he knows and comes to know otherwise. This issue is addressed below, with the discussion continuing as well into the description of the concept of experience.

In general, the interactionist theory states that the child develops new understandings through the operating of

autoregulation arising via activity and consequences. This
self-regulated development takes the course of new structures
in the organism that can be seen to be more differentiated,
comprehensive and balanced. Further, more specific inquiries
into the nature of children's understanding have revealed a
broad, but invariant pattern in the kinds of organizations
they construct as they develop (Dewey, 1895 in Archambault,
1964; Piaget, 1952, 1971). Although differences occur across
individuals and cultures in when the kinds or stages of
thinking appear, the order is the same.

This sequential nature of development may give
educators a general focus and screen for their energies. In
particular, as Kohlberg (1973) has suggested, educational
environments could be designed to match the form of thinking
of the children as they develop,

> The task of education is first, to help stimulate
> the stage of thought in those not yet capable of
> it and second, to extend and deepen this mode of
> thought in those already possessing and capacity
> for it.
>
> (p. 29)

It is common, however, for the adult educator (or
parent), who is experiencing a reality differently
structured, to minimize or misconstrue the significance of a
child's view and capacities and interests and to thus
establish unsound expectations. Often, adults require
of themselves and of students enormous contortions and
expenditures of energy in pursuit of unreachable goals and in

neglect of possible and needed work. As DeCecco (1968)
points out:

> The folly of requiring the student to perform in
> ways for which he is inadequately prepared is so
> often repeated we forget that it is entirely
> avoidable. No matter what feats of will, self-
> denial, and enthusiasm the student may perform,
> and no matter how much dedication, love and
> imagination the teacher may supply, the student
> cannot acquire new performances based on other
> performances which he has not acquired.
>
> (p. 58)

Although the stage aspect of Piaget's work has received
much attention, the key educational implication may be more
appropriately realized in the need and process for spreading
a student's understanding within a stage. This aspect will
be discussed later in this chapter in the section on
experience.

The interactional conception of development urges
teachers to proceed carefully and deliberately and to be
cautious about ascribing evidence of development to isolated
acts. Generally, the whole span of years normally assigned
to elementary schooling are involved with transition into,
construction and consolidation of, and transition out of just
one level of functioning - concrete operations. That such a
long period of time may not be enough for most individuals or
may not be experienced productively by many is suggested by
studies that indicate that less than half of high school
graduates show a capacity for formal operational reasoning
(Langer and Kuhn, 1971). A mathematics curriculum guide from

England, (Nuffield, 1967) where many teachers are working
from an interactionist perspective, reminds educators that

> A moment of enlightenment does not indicate that
> from then onwards the child will be able to cope
> with...the abstract solution of problems but that
> he is entering the significant transitional
> stage. Any attempt to hurry children through
> this stage of development is liable to lead to a
> serious loss of confidence. They will discard
> real materials themselves at the appropriate
> moment...and eventually, when faced with a
> problem will ignore all available materials and
> approach it abstractly.
>
> (p. 9)

The next section explores educational implications of
the interactionist conception of experience. This will
include addressing issues in fostering transition to higher
stages, the role of language and social interaction, and the
general character of productive educational enterprise.

Experience

A conception of experience and its relationship to
growth lies at the heart of the educational implications of
the interactional description of development. When coupled
with the implications attendant on the differences between
child and adult thought, some clear outlines for the role of
schooling in fostering development are evident. This section
discusses aspects of the nature of experience including a
brief examination of the role of language and social
interaction in fostering child development. The summary of
the chapter will follow with a statement of the interactional
theory as an educational guideline.

Dewey (1938) described two principal criteria - continuity and interaction - to differentiate between experiences which are worthwhile and those which are not. For Dewey, it is necessary to ascertain whether for the individual the experience was worthwhile in what it came from and led to (continuity) and to determine whether it involved "a transaction taking place between an individual and what, at the time, constitutes his environment" (p. 43). An examination of characteristics of experiences follows to bring some clarity to how the theory relates to educational practices.

The first characteristic of worthwhile experiences is that of activity, particularly spontaneously or individually chosen activity. Claparede (in Piaget, 1971) points out that from the point of view of the learners, active developmental education "requires above all that they should will what they do; that they should act, not that they should be acted upon" (p. 152). Activity is also seen as purposive that is, from the perspective of the child, there is reason for selecting this activity over all others (Dewey, 1916). Part of purposive activity can be conceived as representing an interest being pursued or, in Dewey's terms, a situation or problem being resolved.

Given activity which involves a chosen interest or problem, then experience consists of the individual's thinking, which for Piaget (1973) is synonimous with action:

"action is not some sort of movement but rather a system of coordinated movements functioning for a result or intention" (p. 63). Experience, then, involves the marshalling of what the individual knows to effect a personally satisfactory solution to a problem.

Active problem-solving conveys the relationship conceived between experience and understanding. Piaget (1973) echoes Dewey in emphasizing the personal and pragmatic quality of experience when he writes,

> thinking cannot be reduced to speaking, to classifying into categories, nor even to abstracting. To think is to act on the object and to transform it. When an automobile breaks down, an understanding of the situation does not consist in describing the engine's observable failure but in knowing how to take it apart and reassemble it.
>
> (p. 90)

The Role of Consequences and Reflection

Built into this conception of experience is a central function for consequences that impact on the individual. The complementary processes of assimilation and accommodation discussed earlier operate in the anticipated and perceived information arising in the course of experience. Intelligence, then, is engaged during such experience. Piaget (1973) uses a metaphor to underline the locus of growth and the relative responsibilities of person and environment,

> Just as when a rabbit eats cabbage, he is not changed into a cabbage, but on the contrary, the

> cabbage is changed into the rabbit, so in all
> praxis or action, the subject is not absorbed in
> the object, but the object is used and 'included'
> as relative to the subject's actions.
>
> (p. 70)

In an experience which meets the criteria of continuity and interaction, the equilibratory process involves what Dewey (1916) called reflection: "the discernment of the relation between what we try to do and what happens in consequence" (pp. 144-5). The meaning and impact of the experience, the degree of change or confirmation in the person's understanding, is not the same across individuals; each person has different experiences. For example, Piaget (1973) has confirmed the personal constructive nature of memory: "What is recorded in memory is not the perceptive and objective...but rather the idea the child creates of it" (p. 44). Interestingly, he found that the description of an arrangement of objects by children at a certain developmental stage was more accurate months after first seeing it than after a week's time. Apparently, the memory of some children improved. Piaget's model is that, in the interim, the child's organization of reality had developed. This suggests a wider time-frame being kept in mind for experience, or perhaps a clearer underlining that experience includes all that has gone before: "the past is constantly restructured by the present" (p. 43).

In the course of undertaking purposive experiences, the child subjects himself/herself to unsettling matches among

his/her understanding, predictions, and perceptions of what
occurs. Resolving these imbalances requires some alterations
in what the child believes. The scope of the alterations
which can be seen to occur (the whole series of decenterings,
for example, and their personal, active nature) leads Piaget
(in Evans, 1973) to regard 'discovery' as an inadequate term.
Rather, he speaks of the child as an 'inventor' and says, "we
are dealing with the construction of new relations" (p. 17).

Two major related implications for the design and
management of educational enterprises can be identified from
this conception of the role of experience.

The first is that what the child knows is intensely
personal and consists of what s/he can and does do. Dewey
(1916) states the view succinctly:

> Only that which has been organized into our
> disposition so as to enable us to adapt the
> environment to our needs and to adapt our aims
> and desires to the situation in which we live is
> really knowledge.
>
> (p. 344)

In particular, the subject matter of knowing is not merely
physical, but is inextricably concerned with the person
(Piaget, 1970). In emphasizing the personal factor in
knowing, this raises the educationally significant concept of
a wholeness or unity to experience. Piaget and Inhelder
(1969) in discussing the recent widespread use of categories
and domains in psychology and education comment:

> there is no behavior pattern, however
> intellectual, which does not involve affective

> factors as motives; but, reciprocally, there can
> be no affective states without the intervention
> of perceptions of comprehensions which constitute
> their cognitive structure. Behavior is,
> therefore, of a piece....The two aspects,
> affective and cognitive, are at the same time
> inseparable and irreducible.
>
> (p. 158)

Such unity is perhaps most available to adult observation in children's spontaneous activities, in their play, which many early childhood educators have taken as their model for an educational environment (S. Isaacs, 1933).

The second implication derives from the view that knowledge is not so much an accomplishment as it is a process; what is learned is not for all time but changes and grows with the learner. Through active experiences which energize the self-regulatory process, the person undertakes constant alteration and reorganization. Teachers holding this view must provision a school arena which expects such change and supports children having experiences. In particular, the subject matter or curriculum for schools might best be seen as built by means of the children's activity.

In summary, individuals exiting schooling know differently from when they entered. Educators intend to affect the nature of those differences, and, indeed, are expected to influence the knowing of their students. The picture for educators that emerges from the interactional view of development is of the child provoking himself/herself

to invent new ways of making sense of experience that can be
coordinated by the individual within a consistent and
connected model of reality (Piaget, 1964; Kohlberg, 1971).

Implications for School Environments

The discussion following identifies major implications
for educators in two important aspects of schooling, language
and social climate. The implications are made given the
acceptance of the interactional position on development as
the aim of education. Chapters III and IV illustrate the
theory further and suggest methods for teachers to explore
their acceptance of this view of developmental education.

The implications are drawn from key aspects involved in
accepting and applying to educational environments the
position as stated by Dewey (1916):

> When it is stated that education is development
> everything depends upon how development is
> conceived. Our net conclusion is that life is
> development, and that developing, growing, is
> life. Translated into its educational
> equivalents, that means (i) that the educational
> process has no end beyond itself; it is its own
> end; and that (ii) the educational process is one
> of continual reorganizing, reconstructing,
> transforming.
> (pp. 49-50)

Language

Earlier discussion described a difference in child and
adult organization and understanding. Thus, although an
educative experience for adults and children involves
activity and problem solving, their experiences are different

in content. The difficulty for teachers is in discerning and providing for experiences for children, when, if they occur, they differ from an adult's in nature and process. Almy (1966) is one who has explored this issue at length; she points to one common but inadequate way educators attempt to bridge the gap to children's way of knowing:

> Piaget's theory leaves no question as to the importance of learning through activity. Demonstrations, pictured illustrations, particularly for the youngest children, clearly involve the child less meaningfully than do his own manipulation and his own experimentation. While the vicarious is certainly not to be ruled out, it is direct experience that is the avenue to knowledge...
>
> (p. 137)

The issue of vicariousness and of other distancing from direct experience characterizes the difficulties of both the adult's use of language with children and of language acquisition and development by children.

Adult language is an instrument of the adult's capabilities for symbolizing, categorizing and relating that do not characterize children's understanding, especially young children. Boehm (1966) emphasizes that "at six or seven years of age, the child has no true concept of time and space, of geographical relations, of past and future" (pp. 370-71). Adult discussions of the world, presentations of problems, stories and plans, and evaluations cannot be followed or shared very clearly by the child. Teachers who saturate the classroom with their language, and thus their

ideas, question and purposes, are risking at best imcomprehension by children. As well, such practices are taking up valuable time that could be used by children in more significant efforts. A relative absence of direct experience is encouraged by dominance of adult language and thinking in classrooms.

Furth and Wachs (1974) point out a further mismatch of many language-oriented school practices:

> a child (of 4 to 10)'s thinking is invariably at
> a higher level than what he can express or
> comprehend verbally; when such a child is
> preoccupied with verbal material, he is not
> likely to be engaged in high-level challenging
> thinking.
>
> (p. 274)

An unfortunate and sometimes beguiling consequence that follows upon excessive reliance in language in schooling is the production of some children who have become facile with words but impoverished in understanding. Many children exiting elementary or secondary schools are victimized by verbal abstraction and formulae to which they can give no concrete, real-life intuitive meaning (Szeminska, 1965). The interactional perspective argues for an emphasis on experience and a recognition that language is a secondary and clumsy tool for educators. There is instead need for school environments which present appropriate challenges. Kohlberg (1966) described the task which overuse of language impedes, especially in elementary schooling,

> formal reasoning develops because concrete
> reasoning represents a poor though partially
> successful strategy for solving many problems.
> The child who has never explored the limits of
> concrete logical reasoning, and lives in a world
> determined by arbitrary, unexplained events and
> forces, will see the limits of the partial
> solutions of concrete logic as set by intangible
> forces rather than by looking for a more adequate
> logic to deal with unexplained problems.
>
> (p. 10)

To rely on language to reveal and comprise the child's

understanding would seem insufficient. It would be

especially unsound to plan growth experiences primarily

dependent on language. Interestingly, deaf children have

been found to be only slightly behind hearing children in

their development (Furth, 1966). Furth and Wachs (1974) have

developed an intensive learning environment for children that

depends far less than usual on language and that uncovers and

builds upon what the child knows. Teachers need to learn to

look elsewhere than language for children's understanding and

for levers for growth.

Piaget (1972) makes the point clear in discussing the

conventional elementary school ages. The point is that

language ought not be the principal and certainly not the

only medium of activity and expression in schooling:

> the operations which make possible the
> combination of classes or relations are actions
> prior to their becoming operations of thought...
> (the child) can combine or dissociate...manually
> before he can do so linguistically....The
> operations +, -, etc., are thus coordinations
> among actions before they are transposed into
> verbal form, so that language cannot account for
> their formation. Language indefinitely extends

the power of these operations...but it is by no means the source of such coordinations.

(pp. 174-175)

There is, of course, a legitimate social aim of producing effective consumers and producers of language. The interactional view sees this aim best pursued by connecting language naturally to reflecting on and sharing of children's activities and inquiries. Such a 'language experience' approach brings language to bear more effectively on its possible and important function in extending and deepening development. A productive view for teachers, then, is suggested by Minor (1964): "children shape the meaning of words from their experiences".

The preceding discussion is not intended as a recommendation for banishing language from schools or from a significant role in schooling. Rather, it is suggested that the interactional position offers a direction for alternative practices to the linguistic determinism and compartmentalization from experience in schools that appear to stifle development.

Social Interaction and Educational Environment

The fostering of auto-regulation translated into educational terms means a school climate which cherishes and nourishes in the child individuality in understanding, approach and process. However, there are social aims for the character of individuality, and there is developmental

potential in processes of social relating. As Wadsworth (1971) has pointed out: "To the extend that concepts are 'arbitrary' or socially defined, the child is dependent on social interaction for the construction and validation of his concepts" (p. 31). Further, the fact is that children come to school in number; a portion of the environment in which they are adapting is social. Since not all actions are possible, since some actions violate the plans or actions of others, and since a child's plans often require participation of others, there is the possibility of dissipating interpersonal conflict, crossings of purpose, and other abrasions of individual developmental effort.

Piaget (1965) describes the opposing qualities of coersion and cooperation which might be used to characterize social relations. In a coercive setting, another person or persons determines what the child is to do; in a cooperative situation, child and other exchange views as equals and set mutually agreeable conditions. In the more coercive situation, the child acts under the direction of another's ideas and purposes; s/he is less likely to engage and thus to confirm or modify his/her understanding. Since the child is often acting to ingratiate or protect himself/herself, the coercive approach trains the child to respond to authority and to suppress inquiry and interest.

In a more cooperative situation, the child exposes his/ her understanding to the arena of experience and consequence.

Cooperative relations with adults join adult interventions with the child's goals and expectations and enhance the developmental usefulness of such interventions. Also, cooperative relations open the child to other points of view and to necessities for articulating and communicating one's own view. A cooperative school climate would appear to allow the child to engage in personally meaningful endeavor and to secure needed resources.

The differences between child and adult understanding and the time and issues involved in development support the educational practice of having children remain with the same teacher for several years. This encourages creation of a climate where they can get to know one another well, where the children can explore their thinking in depth, and where the teacher can expect to see long term results of his/her and their efforts.

It is important to realize that at this point ethical and political positions have intermingled with psychological recommendations, making what Kohlberg and Mayer (1972) call an educational ideology. All adults carry enormous potential power compared to a child and, as mentioned earlier, not all things are possible in a classroom. In addition, some children's ideas and personalities are more appealing and coercive than others. There are, as well, enormous pressures on educators to impose a wide range of activities and performances on children. The necessity to be clear on one's

goals and to draw them from an explicitly stated theory of development is constant in education. The requirement includes ongoing assessment so that the principles one holds are being used actively in relation to what occurs in the classroom with the children. There is particular difficulty in discerning whether a child is "going along," the conventional term, or whether s/he is cooperating. That evaluation rests on the facts of the situation, but also on what it leads to for the child and children involved.

Development as the Aim of Education

For educators to make use of the interactional understanding requires that they establish development (as described) as the aim of education. That is, education must aim to assist individuals acquire increased competence through fostering and supporting the individual's structuring and restructuring of his/her understanding and actions. Efforts to implement educational programs around this general aim have generated various outcomes, including ethical, scientific, political and pedagogical controversies which are beyond the intended scope of this discussion.*

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*Cremin (1961) presents an excellent overview of the Progressive Education movement. Dearden (1968) gives a rigorous philosophical analysis of some approaches to early childhood education, particularly in England. Mai (1975) discusses some critical theoretical issues in the current open education thrust. Hein (1974) traces an historical content and raises important questions about relationships between political and educational reform.

The determination of goals and method and the evaluation of outcome and effectiveness will likely continue to be difficult matters, occupying the energies of each educator, as well as the attention of children and parents, social agencies and politicians and many others. Kohlberg and Mayer (1974) point out the inevitability of combining ethical and psychological beliefs and findings when selecting educational aims, contents and methods. Carini (1974) suggests that, at present, the controversies are to be expected:

> Curriculum is an emotional issue, as is education
> itself. Because these issues are rooted in faith
> and belief (there is no science of education),
> there is ultimately no empirical proof to
> demonstrate the superiority of one approach to
> another.
>   (p. 146)

There has been considerable attention given to levels or stages of functioning. Sometimes, there is drawn the educational implication that the aim of educators dealing with only a segment of a child's life should be fostering attainment of the appropriate next level (Furth and Wachs, 1974; Weikart et. al., 1971; Kohlberg, 1973). The levels may provide rough guidelines for teachers; the means for educators to influence development lies in the process of autoregulation or equilibration. That is, the fundamental principle is that development is characterized by what Dewey (1916) called active "reorganization of experience which adds to the meaning of experience, and which increases the

ability to direct the course of subsequent experience" (p. 76).

Given the conception of development as a natural occurrence of person/environment transactions, implications for educators lie in their better understanding the persons they seek to influence, their conception of important elements of person/environment transactions, and finally, in their sense of appropriate roles and behaviors for the teachers. Through acting on their understandings, educators will be providing additional impetus for development.

CHAPTER III
ILLUSTRATIONS AND IMPLICATIONS

Chapter II discussed two key features of the interactional theory that have major educational significance: (1) the concept of major differences in child and adult understanding, and (2) the concept of experience and its role in development. Since the dissertation concerns influencing teachers' personal theories about development and teaching, the general framework for Chapter III is to illustrate these key features and to identify suggestions for the role and responsibilities of the teacher.

First, some episodes of children's activity are presented and discussed in the context of the theory. Then, a discussion of implications for the teacher is presented, including a discussion of the interactional perspective on the conventional educational concerns about learner achievement and motivation. Chapter II and III together represent the general orientation toward development and teaching which teachers can explore using the methods discussed in Chapter IV.

Illustrations

One of the difficulties of illustrating aspects of the theory is that most basically it is a particular orientation

as well as various parts. Kohlberg and Mayer (1972) have pointed out the different educational ideologies which derive from different general beliefs about principles and dynamics of growth. Certain theoretical concepts have been outlined and various elements have been highlighted in the discussions in Chapter II. However, application of this theory (or any other) as an educational guide depends on responding with a sense of the whole. Carini (1973) in discussing this fundamental tension in the relationship between theory and practice, points out that

> the theorist may choose to separate learning from thinking, or feeling, or imagining, but the person must support them all together.
>
> (p. 11)

In particular, the teacher is in daily contact with children who come to him/her "all together." The illustrations* in this chapter all contain several aspects of theoretical interest. They are discussed only partially as examples of particular elements. However, they are recognized and intended as well to be slices of behavior which suggest insight into general processes and combine to illustrate the general way of viewing children and development. To the extent that the examples and discussions are concrete, they model for the teacher a means to reflect on child behavior

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*The illustrations were collected from various kinds of reports and are subject to numerous alternative explanations and questions about objectivity and reliability. The reader should not think that an attempt is being made to prove the theory; the purpose is, rather, explanatory.

and the interactional theory. As such, these episodes act on Dewey's (1900) call for means "to secure a translation of large words and ideas into specific images" (Rattner, 1963, p. 295).

Differences in Child and Adult Thought

Episode 1

> At age 6:8, the child is given a set of wooden beads, eighteen of which are brown and two of which are white.
> (Adult) 'Are there more wooden beads or more brown beads?'
> (Child) 'More brown ones, because there are two white ones.'
> 'Are the white ones made of wood?'
> 'Yes.'
> 'And the brown ones?'
> 'Yes.'
> 'Then are there more brown ones or more wooden ones?'
> 'More brown ones.'
> (Piaget, in Richmond, 1971, p. 38)

For most adults, it is not difficult to know a bead to be both brown (or white) and made of wood at the same time and to form and reform various groupings of beads mentally or physically to answer various questions. But for this child, who might be a first grader in most American elementary schools, it is impossible. Moreness as a concept can be applied by the child to only one concrete example at a time. Coupled with the overwhelming sensory characteristic of color, the child reasons brown to be correct because the only problem the child can perceive here is a comparison of brown to white. To answer 'wooden' requires abstracting wooden

from the brown beads and from the white beads, combining them into a class of wooden beads, then coordinating a comparison of that class with the simultaneously held class of brown beads.

Many adults, having an experience with a child like the one above, conclude there was something amiss with the way they asked--the child must not have heard the question properly. The interactionist position, supported by considerable research, is that the child could not <u>conceive</u> the question the adult asked and found another to address. The episode is an example also of concrete focus and egocentrism in that the child is overpowered by the number of brown beads; that is, the child's concrete sensation governs the limits of his/her reasoning. When asked 'How do you know?' the child divides the beads into brown and white piles and says 'See!' In the same way another child (6:0) can say: "I've lost my pen because I'm not writing" (Piaget, in Richmond, 1971, p. 24).

Episode 2

The setting involved manipulating and deciding which objects in a group would sink and which would float:

> age (5:6) after having said in reference to the plank, 'It goes to the bottom.' - 'Why?' - 'Because it is heavy,' adds a little while later, 'because it is big.' Then he sees that the plank floats and explains...'It's too big and then there's too much water'....A moment later he tries to hold it at the bottom with another plank and a wooden ball: the two come back up 'because

> this plank is bigger and it came back up' - 'And
> why does the ball come up?' - 'Because it's
> smaller.'
>
> (Inholder and Piaget, 1958, pp. 26-7)

The lack of consistency in explanations of predictions and
observed results in characteristic especially since the
child's intelligence is more focused in the physical activity
with objects and water. One feature of a particular object
is a perfectly possible reason for its floating while the
same feature explains another object's sinking. The child is
centered or fixed on one aspect of the event and does not use
mobile ideas like classification or properties separate from
discrete object/action events. This and the following
episode illustrate the differences between children and
adults in their use and understanding of rules and
abstractions.

Episode 3

The child matched the proverb "When the cat's away the
mice can play" to "Some people get very excited but never do
anything." When asked for his justification he said,

> age (8) Because the words are about the same....
> It means that some people get very excited but
> afterwards they do nothing, they are too tired.
> There are some people who get excited. It's like
> when cats run after hens or chicks. They come
> and rest in the shade and to go sleep. There are
> lots of people who run about a great deal, who
> get too excited. Then afterwards they are worn
> out and go to bed.
> (Piaget, in Ginsburg and Opper, 1969, pp. 110-111)

Clearly, the child's interpretation of the parable is inadequate from an adult perspective. What has occurred is a lumping together of elements and ideas to make a temporal sequence that works for the child. For this child, causation (and morality) seems to be primarily a physical and temporal matter--events follow upon one another depending on expenditure of energy. There is a probability that in this child's life one who runs about a great deal is worn out and goes to bed. So the child has abstracted and applied rules from experience, but they are tied to concrete variables and yield a very different 'moral' for the story than perhaps most adults would desire or expect.

Other examples of children's perspectives are evident in the rules and explanations they construct in response to their observations. Following are several episodes drawn from statements made by the author's daughter:

Episode 4

    Age (4:10) 'Daddy, where does the snow go?'
              'Where do you think it went?'
              'It goed underneath the grass.'

Episode 5

    Age (4:11) 'Where does the night go?'
              'In the morning you mean? Where do
                  you think?'
              'I think it goes around the corner.'

Episode 6

> Age (5:2) Having noticed the moon at the
> beginning of a car trip, on arriving home and
> seeing the moon again, she shouts: 'Look! The
> moon followed us home!'

It is not unusual to hear children make such endearing

statements (nor to hear fathers repeat them). The intriguing

point, from the interactionist perspective, is that these

explanations are <u>true</u> to the child and are necessary in order

to coordinate satisfactorily what the child knows and has

observed with a problem, in these cases that of appearing and

disappearing phenomena.

Episode 7

> Age (4:6) Observing a television program where
> letters emerge from actor's mouths to spell the
> words they are saying:
> 'Daddy, do they have letters in their mouths?'
> 'No, sweetheart, that's just something the
>   television camera does.'
> 'They have the letters in their tummies!'
>   (emphatically).

The firm convictions that children display

spontaneously about their interpretations of various

phenomena often reveal the nature of their sphere of reality,

suggesting what kinds of ideas, forces and activity are

plausible and possible to them. The teacher (or parent) who

is alert can learn much by listening, especially to what the

child questions (physically as well as verbally) and to what

represents a satisfactory approach or answer to the child.

The child can interact with the phenomena in meaningful ways, even though s/he deals with some aspects in a way an adult would label as magical.* Being wrong from an adult viewpoint does not mean absence of intelligence or that the child cannot engage in stenuous and productive inquiry only that there are limits in scope.

The following two episodes also illustrate child/adult differences and lead into illustrations of the concept of experience.

Experience

This example from a mathematics curriculum guide (Schools council, 1972)** provides an illustration of children's understanding adapting to events and experiences in a school context.

Episode 8

> some (children)...had been chasing their shadows
> one day. Noticing their interest, their teacher
> suggested that they should chalk in the shadow of
> a pole in the playground at each hour during the
> day. At nine o'clock they all watched one boy
> draw a line along the shadow. They then chose
> two boys to draw the shadow at ten o'clock. An
> hour later the teacher was hearing a girl read

---

*Although, in this case, the television techniques are magical for a good number of adults as well. Few would posit letters secreted in actors' anatomies, however.

**The book contains many other extended records of children thinking, some describing children investigating a problem at various levels according to their development. It also illustrates many worthwhile teacher practices for extending and confirming children's investigations.

> when she was disturbed by an angry voice saying:
> 'You moved it!' 'Moved what?' she asked.
> Ignoring the question, the angry voice repeated:
> 'You moved it. I'm going to sit here and watch
> you for an hour so that you can't move it next
> time'...the teacher collected the children
> together and they sat in the sunshine for some
> time, watching the shadow of the (pole) move.
>
> (p. 38)

The degree to which the angry child is aroused by observing

an unexpected outcome is suggested by the willingness to

accuse the teacher of dishonesty (and the decision to, in

effect, imprison her to prevent further mischief). The child

decided that some known superior force (an intruding adult)

must have interferred with the child's prediction that the

shadow would not change. Although the final outcome is in

doubt and probably depends on many other experiences with

light, shadows and time, clearly the child (and perhaps

others in the group) has been engaged in vigorous

intellectual activity at the highest reaches of his/her

thinking.

Episode 9

> A five year old...was trying to read a card which
> said, 'Which is heavier, a cup of peas or a cup
> of rice? Guess first.' The boy found the words
> 'heavier' and 'lighter' on a pair of scales. He
> matched the words 'peas' and 'rice' with the
> labels on the jars containing these objects. He
> then asked an older boy what the word 'guess'
> was. He said aloud, 'I guess peas because they
> are bigger.' He was astonished to find that the
> cup of rice was heavier. He repeated the
> experiment three times and was still puzzled.
>
> (Schools Council, 1972, p. 13)

In pursuit of his problem, the child applies what he knows--
his information about where things are in the room, about how
to ask for help, his sensorimotor understanding of grasping,
and his knowledge of matching. He also applies what he knows
about size/weight relationships (bigger is heavier). In both
the preparation and the experimenting he is balancing,
incorporating, acting and modifying. His trust in his
thinking is evident in the fact that he repeats the
experiment when it fails to produce the expected results. He
has found the correct answer from the adult point of view,
but he is not convinced. His understanding does not undergo
an immediate transformation, although he has a puzzle that he
cannot resolve at present. The child is thinking at a very
high level, probably at the limits of his capacities,
transcending the trial and error method into intelligent
reflection.

The episodes above illustrated broad aspects of how
children's thinking differs from that of adults.*
Experiments by Piaget and others have traced the gradual and
uneven course of development over several years in children's
capacities to conceive and act in more flexible and
comprehensive ways. It is not the task of this chapter to

---

*To be sure, many adults are, like this child, prone to
decisionmaking based on evidence from one variable only--the
size of a bean versus the size of a grain of rice. The
coordination of variables in problem stating and problem
solving is far from being a universal adult characteristic.
The author does not wish to oversimplify.

detail the particular features which investigators have found. Rather, these illustrations and the ones following represent part of an approach for the teacher-observer to take in exploring his/her understanding of children and development. These examples are intended to provide shape to the general position stated in Chapter II and summarized by Carini (1975)

> the life-span of the person is conceived as the structuring of changing spheres of reality, each sphere representative of a stage in the differentiation and identification of the person to himself, and his commitment and differentiation of a knowable and articulate world from the flow and flux of events in which we are immersed.
>
> (p. 32)

Below are some episodes of children at work. They are chosen to highlight the process of equilibration as described in Chapter II. In general, the episodes are illustrative of the characteristics of experiences which provides observers with indications of equilibration.

Episode 10

> A young child was observed making a mess on his desk during snack time by breaking up his crackers into tiny pieces. When asked by the observer what he was doing, he replied that he was making an 'infinity' of crackers. When asked what that meant, the reply was that he was breaking them into pieces until he could not count any more.
> (Weikart et. al., 1971, p. 127)

A teacher intent on socialization might have missed the child's thinking completely. It is also possible that the

child began with the idea of breaking crackers into tiny bits and was induced to speculate on infinity by the observer's interventions. This may exemplify a way to support and extend a child's activity. At any rate, the episode shows some of the parameters of this child's thinking. His experience may be primarily an inquiry into the motor/ tactile/visual activity of breaking crackers, or it may be a concrete mathematical investigation of infinity. In this case, greater specificity depends on observing what inquiry occurs next for the child over time and on imbedding this episode in the context of his past experience. For him/her, the world seems bounded by the limits of his personal activity: "until he could not count any more."

The following three episodes are taken from observations of the author's daughter,

Episode 11

Age (5:3) Presented with a serial progression of objects (one apple, two apples, <u>etc.</u>), she counted and recounted the third group several times getting several different answers: 'This <u>has</u> <u>three</u>, but I can't count it to be!'

In this instance, the repeated counting (without any intervention by the observer) coupled with the emphatic decision to rely on internal conviction seems to show some of the interaction among internal structure, action, and consequences. The returns she received from counting were unexpected, and in this case, she felt impelled to respond

(by recounting and finally deciding to trust her internal
model). Of course, she might have made several other
responses; for example, deciding the group had four apples,
asking for help. In this case, it seems clear that she was
guiding her observable activity with reference to an internal
model of reality. There was both an interaction occurring
and an internal agent or executive force.

Episode 12

> Age (5:5) She asked one day:
> 'Did the sun shine before I was born?'
> She had been talking for some time about growing
> older, about birthdays and grey hair, about
> relative ages of herself and her younger sister
> ('How old will I be when Jennifer is 6?') and
> about her origins:
> 'Where was I before I was born?'
> 'In a special place inside Mommy's body.'
> 'No, I mean before that.'

In short, she was exploring the meaning of time in relation
to herself. The question of the sun shining before her birth
indicated that she is beginning to notice or suspect that
there might be an objective world which is connected to but
distinguishable from her subjective experience. She is
seeking to understand by means of these questions which may
seem absurd to many adults. It is important to note that
such thinking is only the beginnings of the transformation in
her understanding, a transition of decentering that will take
place over a long period of time: while asking these
questions, at the same time 'near' can mean Grammy's house a
thousand miles away, and 'far' can refer to the house across

the street. For the teacher such questions and interests are indicators of beginnings rather than evidence of accomplished understandings (Nuffield Foundation, 1967).

The next episode also highlights the interactionist view of the constructive nature of intelligence and development.

Episode 13

> One morning, in response to urgings that she make haste in getting dressed, the author's daughter, aged (4:0) said that she would but only 'when it gets a little morer morning.'

First, her statement suggests that she has some sense of future personal time and can mentally separate what she is doing now from something else she will do later. But these could be an artifact of habit, a trained physical pattern repeated nearly every day. However, the word "morer" had never been uttered in her presence to the author's knowledge; nor had she said it before in the author's presence. A very persuasive explanation is that she had constructed a rule for comparative situations of adding the suffix "-er." She recognized the need for a comparative meaning on this occasion, assimilated it to her rule, and produced the word, "morer." The fact that the word is a jaw-twister and had never been heard was irrelevant in the face of the rule she had built to organize other language experiences.

Chapter II discussed reflection as a part of the interactional conception of development. The following two

examples seem to illustrate children reflecting in problem-solving experiences.

Episode 14

> Willa, aged 8, thought of 63 things she could use to carry water in. After she had thought of about 40, she paused. Wrongly concluding that she was finished, the observer began to speak. Willa glanced up and said, 'If you can give me a minute or two to think, I know I can think of some more.' With that, she tilted back her chair, shoved her Brownie beanie over her eyes, and thought. The organization of her thinking is revealed in the much greater frequency of such comments as, 'I could make a clay cup and varnish it,' 'I could get a drill and bore a hole in a chuck of wood,' over (earlier) solutions such as, 'some things are hollow inside, like a hollow statue.'
>
> (Carini, 1973, p. 45)

Willa made the original imposed situation into her own investigation. She became aware of the possibility of going beyond her immediate thinking ('I know I can think of more'). In reflecting on her experience, she selected action, skills and qualities which she could apply; she was both assimilating and accommodating within the experience. It is interesting to note the time she took and the insight into her thinking that came when she had become invested in the problem. In this case, in extending her own thinking, Willa's ideas are associated with her body and its actions. At the same time, she is able to focus on and select attributes of objects and processes as instruments for solving the problem.

Not many children take such a dramatic pose as The Thinker; perhaps only the concrete nature of the water carrying problem permitted Willa to be as noticeably abstract as she was. Episode 8 on page 56 illustrates what is perhaps a more common indication of reflection in children: a step-by-step physical acting out of ideas to see what happens. The following episode also shows a child physically 'acting out' her thinking:

Episode 15

> In the course of her play, Judy began grouping
> objects by color, making a red group and a white
> group. She noticed a red pencil with a white
> end. She put it first into the red group and
> then into the white group. She was noticeably
> perturbed. Neither solution satisfied her.
> Finally, she placed the pencil so that the red
> end was near the other red objects and the white
> end was near the white objects.
>   (Hammerman and Anderson, 1974, p. 178)

This example seems to provide a visual record of a child experiencing a moment of tension, an imbalance or disequilibrium between a view that an object can belong to only one group at a time and a realization that groups can overlap. Her actions illustrate both the content of thought as it develops and what a child in the process of change may be doing.

The following episode provides another illustration of a child reflecting and stretching his understanding to its limits.

Episode 16

> Frank, aged 10, had been judging with great ease
> the size of two and three objects to find the
> biggest one. Reaching the last series of three,
> a much more difficult series than he had yet
> encountered, he picked up two of the ·blocks and
> said, 'Hey, that's a choice. Say, I don't know
> if I can do this. I'd need to have a ruler, ya
> know, and measure it off, like, you know, in
> squares. If I'm gonna guess, I'll have to think
> of this one (a tall, thin block) doubled up, and
> this one (a short, thin block) stretched out....
> It's this one.' He extended the biggest block to
> the observer. I'll bet it really is, too. I
> wish I had a ruler to check it.'
>
> (Carini, 1973, pp. 45-6)

In this situation, Frank's thinking is primarily concrete;

that is, his approach and frame of reference is tied to and

revealed in his handling of the materials. He is able to

imagine actions and predict a strategy for solving ("measure

it off...in squares"); and as he struggles to apply some of

his knowledge ("doubled up...stretched out") he is engaging

in high level explorations at the limits of his

understanding. In this situation, and with the anchor of

handling the actual materials, Frank's involvement is

dependent on his body and its actions. While beginning to

extend to more abstract strategies, he definitely wants to

confirm his theorizing with some evidence from a ruler.

Rimat (cited in Vygotsky, 1962) summarized this key

characteristic of thinking in childhood and early

adolescence,

> Thought in concepts, emancipated from perception,
> puts demand on the child that exceed his mental
> possibilities before the age of twelve.
>
> (p. 112)

Implications for the Classroom

Serious consideration of educational applications of interactional theory requires accounting for the concerns of the classroom teacher who must judge the value of the principles for his/her work. It will be the task of Chapter IV to articulate some methods for teachers to examine the pedagogical worth of the theory. Thus far, this chapter has provided suggestive illustrations of some features of the theory discussed in Chapter II as having major educational significance. The remainder of this chapter is focused on the guidance the theory gives to resolving concerns about student motivation, student achievement and the role and responsibilities of the teacher. Together, the key features, the style of illustrations, and the answers to concerns, help form and focus the strategies for exploration that are recommended in Chapter IV.

Prescriptions or guidelines for educational practice are inevitably overtly or covertly tied to value positions taken on ideal aims and on derived principles about means for effecting progress (Kohlberg and Mayer, 1972). In a discussion that criticizes the interactional position on some issues, Dearden (1968) has argued persuasively that the interactional philosphical, psychological and educational ideology has as its general tenet "the ideal of a personal autonomy based on reason" (p. 46). Further, his discussion

shows that ideal to be an aim which can provide means for
direction and evaluation:

> the ideal is of increase in understanding,
> gaining in independence, and progressively coming
> to realize what is involved in forming
> intentions, making considered choices and
> accepting responsibility for them.
>
> (p. 49)

In the interactional educational ideology, the ideal is
also seen as a characteristic tendency of life, and as
significant in children's energies as in adults'. It is held
that there is a level of coherence and autonomy possible
within each sphere of human reality that is intrinsically
worthwhile (Weber, 1972; Carini, 1973). That is, childhood
is conceived as a positive state as much as adulthood. As
Dewey (1916) has summarized, child and adult alike

> are engaged in growing. The difference between
> them is not the difference between growth and no
> growth, but between the modes of growth
> appropriate to different conditions.
>
> (p. 50)

The educational goals and processes derived from the general
position and aim, then, relate to observing and assisting the
continual use and development of autonomy (Dewey, 1916;
Piaget, 1964, 1971).

In particular, the theory advocates serious attention
to the current activities of children as organizing centers
for educational experiences. Immersing children in an
educational system subject to what Dewey (1916) has called
"the vice of externally imposed ends" leads to acquiescence

(as well as rebelliousness and inertia).* Rather, the locus
of curriculum and educational effort lies in the child's
current expressions of purpose, effort, interest and
judgment. Teachers then are working with individuals who
happen to be children and their work is "the enterprise of
supplying the conditions which insure growth, or adequacy of
life" (Dewey, 1916, p. 51).

Having restated the general context, following are
brief discussions of the interactional position on the
educational issues of achievement and motivation: 'What is it
that is learned?' and 'Where does the energy for the learning
come from?'

Achievement

In consonance with the aim of autonomy, as well as in
connection with observations of children in action (suggested
by the epidodes earlier in this chapter), what is
accomplished or learned in the conventional sense is control.
What is achieved by the person, then, are competencies to act
effectively. This is in contradistinction to, for example,
Gagne's (1965) careful elucidation of carefully imposed
educational objectives resulting in products he called
"capabilities."

_____

*Such impositions stultify and inhibit teachers, separating
their intelligence and experiences from their work (Dewey,
1916, pp. 100-110 and Sarason, 1971).

Some observers have described general sequences to development, identifying categories and levels of competence that develop in the same heirarchy in all individuals (e.g. Piaget, 1952; Elkind, 1972). These observations and other efforts at finding norms in human development could be helpful to teachers in sketching expectations and in planning for general classroom conditions. They may also help build a broad framework for understanding individual children which can then be confirmed and extended by detailed and long-term experience and observation of the child.

For example, Elkind (1972), in tracing some educational applications of Piaget's work, described development during childhood as characterized by a sequence of searches or tasks which, as they are accomplished, afford increasing mastery or control. He then sketched some general processes and types of activities matched to the goals of the searches which could guide teachers as they build responsive educational environments and as they themselves interact with children. Such discussions can help teachers build what Carini (1972) called "a developmental baseline descriptive of the child during the childhood years" (p. 2).

However, it is important to guard against merely substituting another rigid ladder of external aims to compare the child against and against his/her peers. In particular, it is critical to avoid imposing labels and timetables which remove attention from the child in action in favor of a

counter-productive press on acceleration and efficiency based in an antithetical educational ideology (Dewey, 1916; Piaget, 1974; Weber, 1972). One of the more respected and structured curricula developed around the interactional theory (Weikart, et. al., 1971) in describing the ingenuity required of the teacher emphasizes a three-fold planning process: "Look at the child, look at the goals, and then develop an activity" (p. 15).*

The analyses of theory and curricular possibilities can help teachers organize their longitudinal experiences with children so that the genesis of a process in earlier organizations and activities can be seen as well as its transition and transformation in later organization. Thus, the curriculum becomes the course of what has been studied. Responsive to children's accomplishments, the curriculum in the ideal becomes part of the children's record of achievement shaped as it is by the children and teachers during their inquiries. The curriculum concerns mental structures and ways of experiencing which are progressively acquired over time in the course of specific experiences and webs of activity rather than an artificial "rucksack" of ideas and bits of skill and information (Dearden, 1968).

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*It may be that the major contribution that interactional theory and methodology can make to educational practice is in facilitating centering of attention on the child rather than on curriculum.

Motivation

The question of the wellsprings of energy in this interactional context is related directly to the view of growth as natural and adaptive, proceeding in the course of the individual's intentional actions and adjustments to consequence. In a school situation where the child is experiencing "real wholes" or continuity in his/her interactions (Dewey, 1916), motivation is evident in the seeking of results. Another way of saying this is that ideally children (and adults) are focused on the outcome of their activities rather than on the mediating process (Polanyi, 1964). In listening, for example, attention and energy are directed on acquiring meaning rather than syntactic or phonic analysis. Such intentionality of goal-directedness incorporated into the plans, structure and expectations of the classroom comprises the interactional conception of motivation. Concern for outcome does not mean lack of investment and energy commitment to the means for achieving a result. On the contrary, the having of a real goal makes effort possible, whereas a vague yearning or imposed goal is less effective. As Dewey (1964) has pointed out in a neglected essay,

> The really important matter in the experience of
> effort concerns its connection with thought. The
> question is not the amount of sheer strain
> involved, but the way in which the thought of an
> end persists in spite of difficulties, and
> includes a person to reflect upon the nature of
> the obstacles and the available resources by
> which they may be dealt with.
> (pp. 50-51)

Clear personal intent supplies the structure for overcoming difficulties and adjusting to surmount obstacles. This is the interactional approach to a functional notion of discipline within an overall context and aim of autonomy.

The compelling impetus for initiating and sustaining productive activity comes from observation and analysis and finally definition and combines a general curiosity 'drive' (Berlyne, 1960) and a more focused motivation for competence in the environment (White, 1959). In addition, as the individual becomes more differentiated in the decentered sense, the social environment becomes more available and channel and support development in the process of identification by such processes as emulation of models and commitments to social responsibilities (Piaget, 1973; Bruner, 1966).

School can provide both specific and general experiences in this process of development of commitment and character. The deemphasis of the desirability of extrinsic or deferred reward and punishments in the discussion above should be evident. While not denying the short-term behavioral potency of external reinforcements, the interactional position is that their serviceability to the goal of autonomous, humane individuals is both illogical and unproven (Montessori, 1912).

The Teacher's Role

In this and all preceeding discussions, the author does
not wish to imply that the interactional theory supports
educational practices diminishing the role of the teacher.
Contrary to misinterpretations, such as those documented by
Cremin (1961), there is a strong role for alert, sensitive
and knowledgable teachers to provide opportunities for
children to encounter consequences and disequilibria, to
devise, propose and test more adequate solutions. These
means include the teachers' actions either directly and
personally or indirectly through the conditions, structure
and materials of the physical and social classroom
environment. The interactional theory does not lead to a
pedagogy anticipating spontaneous generation of new concepts
and competencies. On the contrary, there are very active and
direct and imperative needs and responsibilities for the
teacher (Dewey, 1916, 1938; Bruner, 1966; Dearden, 1968;
Devaney, 1974).

An elementary classroom can be characterized by its
resolutions of the tensions inherent in many of the paradoxes
typically present. For example, stated somewhat
dramatically, the teacher is the most knowledgable person
present and usually the best equipped to devise solutions to
any problem which arises. At the same time, when the aim is
development of autonomy, theoretical as well as logical

restraint keeps the teacher from being the main supplier of solutions. The way out of that corner lies in the tenet that children are strongly motivated to seek their own solutions and resolutions, provided they are engaged.in personally meaningful endeavor. Another example of classroom tension is that although the theory holds that children must be experimenting and experiencing consequences, they also are not going to benefit from frequent, overwhelming failure. The classroom needs to offer challenges matched to the childrens' current and developing competence (Hunt, 1969).

In taking responsibility for leadership in a classroom, the teacher is continually seeking to balance these and other tensions so that development can occur. This requires attention to the ongoing and potential activity to uncover meaning in events. In other words, "What is immediately needed is that teachers bring to bear on their day to day problems astringent intellectual scrutiny" (Plowden, 1967, para. 550). Of course, the conscientious teacher has always sought to understand the children and to plan according to individualities no matter what the educational approach. The discussion here concerns the particular kind of attention to individual children and classroom incumbent on a teacher who is following interactional principles.

Interactional theory leads to a very demanding role for the teacher. The teacher is asked to come to understand and work with the child's experience and direction, what Weber

(1974) called the child's "learning thrust." Thoughtful discussions of implications of interactional theory have suggested that what is required ultimately is a transformation of the conventions and conceptions of schooling and teaching (Kohlberg and Mayer, 1974; Furth and Wachs, 1974; Dearden, 1968).

The difficulties are complex and solutions are by no means clear or readily available. For example, the concept that development occurs through the individual's adaptations of self to consequences has led to a model for teaching strategies of matching child and educational environment, especially exposing the child to encounters one 'level' above his/her current place in the heirarchy of lives (Hunt, 1969; Turiel, 1969; Kohlberg, 1972). At the same time the difficulties of ascertaining and managing such matches are recognized (Szeminska, 1965).

Teacher actions taken toward the end of matching but based on inaccurate or incomplete understanding of the child might be deseribed metaphorically as 'pushing on a string.' Yeomans (1969) points out that one frequent consequence is that "without care, we very often give the children so much help that thought on their part becomes unnecessary" (p. 18). Also, it is not uncommon for a teacher to become so mesmerized by his/her curriculum ideas that what has been interesting to children in the past becomes confused with what are, in fact, the interests of the present child or

children (Weikart, et. al., 1971; Weber, 1974). It is possible for parent or teacher to become fixated on a particular goal for children in the absence of evidence of progress and "at the cost of neglecting more appropriate developmental activities" (Furth and Wachs, 1974, p. 51).

The discussion earlier in Chapters II and III have pointed out differences in child and adult thinking; even the sensitive and knowledgable teacher can misconstrue the meaning of children's activities. Carini (1974) cites an interesting example. A skilled and experienced teacher wished to respond to the all-encompassing interest of three months' duration of a group of 10-and 11-year old boys in forts they had built from packing crates. Although the teacher read stories, arranged field trips and tried to organize discussion, the children had shown no inclination to build on their apparently compelling interest. An outsider observed the group and found,

> as it turned out, they were not playing forts.
> Two boys had set up school....Five others...were
> in the process of continually rearranging and
> transforming the space of four boxes....The boys'
> polite lack of interest in the teacher's efforts
> at extension was understandable.
>
> (p. 150)

Having restructured her analysis, the teacher was able to devise several possibilities for capitalizing on the boys' actual interests.

The difficulties and vagaries of adequately analysing and acting, coupled with the dependence on internal

motivation, can be seen as justification for a pedagogy based on adult non-interference. Elkind (1971), one of the more respected of Piaget's admirers, seems to lend support for less-intrusive teaching (for early childhood settings, at least) when he advocates 'intelligent neglect':

> by that I mean providing children with an environment appropriate to their growing intellectual, emotional and physical abilities and with the opportunity to interact with materials at their own discretion.
>
> (p. 25)

These suggestions of teacher passivity are also an outgrowth of interpretations of statements which can be found in the literature on interactional theory such as that of Sinclair (1973) who found that imposed solutions do not foster progress, "progress results when the subject himself discovers the link" (p. 57). Some supporters (and critics) of Dewey's work interpreted his ideas as advocating child-dominated, unstructured, caretaker kind of teaching (Cremin, 1971).

The analysis of teaching/learning models is beyond the scope and intent of this dissertation, as is the description of elements of a model for teaching based on interactional developmental theory. However, a few comments about the difficulties discussed above are necessary and will serve as lead into the two main points to be made about the teacher's role in working toward and interactionally-based classroom: the teacher as observer and the responsive environment.

Recent discussions have pointed out again that there are several strains of educational orthodoxies with various positions on what are the roles and responsibilities of teacher and student (Kohlberg and Mayer, 1974; Kohlberg, n.d.). It is not necessary to be child-centered if one is not teacher-centered; mixtures are possible. In addition, Bussis and Chittenden (1970), in seeking new methodologies for evaluating classrooms found even the one-dimensional continuum (child vs. teacher control) too confining for accurate conceptualization or description. They constructed an axis which compares levels of child and teacher activity in the classroom (Figure 1):

Figure 1

                              High

        Laissez-faire   Open Education
        (Free School)

    Low   Contributions | of the Teacher   High

        Programmed Learning   Traditional

                              Low
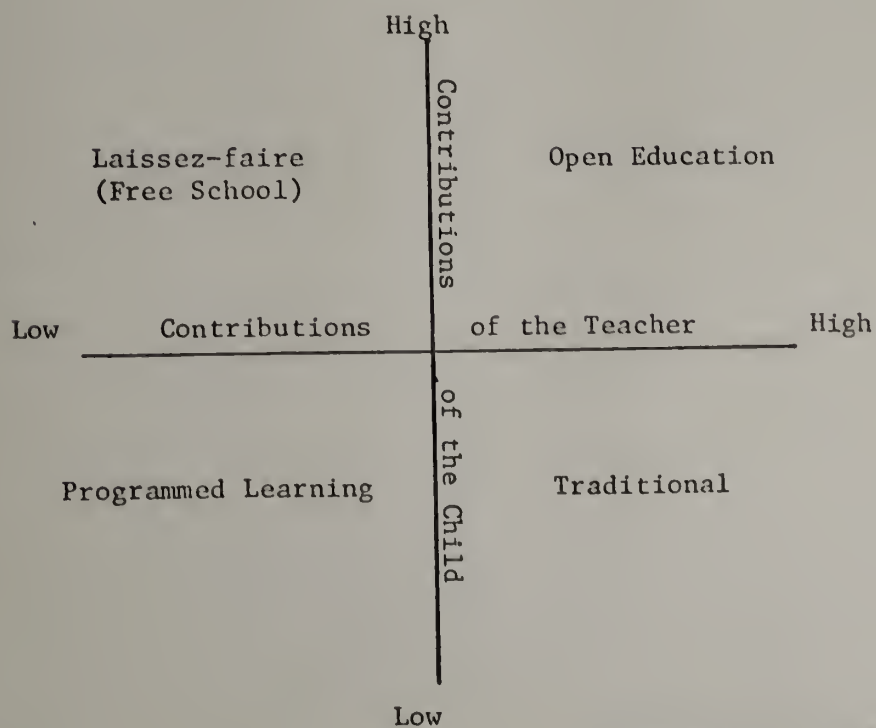
                        (Bussis and Chittenden,
                         1970, p. 22)

This appears to be a useful tool which allows consideration of high levels of student initiative and energy occurring in the same classroom as high levels of teacher initiative and energy. Focusing on the upper right quadrant as the arena for fostering development as discussed, the question to be addressed then is: Upon what is the teacher expending high energies and initiative?

The chapter ends with a discussion of the above question. The two general teacher functions selected as means to address the question relate to observation and to the responsive classroom environment. There are numerous other variables identified which affect or offer perspective on a teacher's professional behaviors, including physical health, colleagial and authority relationships, experience and training. A decision has been made to treat observation and environment as most significant in terms of the implications of interactional theory for teaching. Other variables, although critical to realization of the implications in school settings, are more germane to the problem of change.

Observation

Observation might be thought of as a search for the child's individuality. The discussion in Chapters II and III thus far has indicated in general some of the reasons and topics for teachers to observe. Chapter III has also

presented, through illustrations, some ways to reflect on observations. Chapter IV will suggest several experiences teachers can undertake to collect their own information. Following in a brief discussion of a recommended orientation to observation: what to observe, where to find it, and how to go about observing so that useful information is likely to emerge.

First, it is useful to look at the child when s/he is engaged in spontaneous activity, in something that appears to be done for its own sake and is self-motivating and enjoyable. Such activity often consists of what many adults would call 'play' and reveals much about what a child knows and wishes to know (Moore and Anderson, 1969; Bruner, 1975).* In these situations, often accompanied by absorption and intensity, an observer is exposed to "total responses of children to whole situations" (S. Issac, 1933, p. 4). The observer should be looking both for what seems to attract and for what challenges the child. Also, the observer should note old as well as new interests, discarded as well as maintained (Hunt, 1969).

Second, the content of the observations is found in the child's overt activity. For the elementary school age

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*The growing body of theoretical and empirical support for the cognitive and social 'work' imbedded in children's play includes the following sources: Issacs (1933), Erikson (1950); Piaget (1951); Lieberman (1965); and Sutton-Smith (1967).

person, at least, actions and understanding are primarily
expressed and existent in physical actualities. Bliss (n.d.)
summarizes this aspect of where the observer ought to expect
to make significant observations: .

> The child from about 5 until about 13 is bound to
> reality, tied to reality, thinking about real
> things even if they're not in front of him, but
> in his head. He's not thinking in terms of
> hypothesis and abstractions, he is thinking about
> real things.
>
> (p. 9)

Even the child's language is an unsteady resource compared to
actual tasks and activities (Furth and Wachs, 1974).

Finally, an observer needs to be clear on his/her
purposes in observing--all observation is necessarily
selective. For example the situation should be structured so
that the teacher/observer is focusing on understanding the
child or children rather than on what s/he is going to do
next. A teacher's attention on starting a discussion on the
water table would be to discover the children's thinking
rather than on planning for the next day.* In addition to
formal and informal times for looking and listening, the
teacher/observer should initiate or intervene in activities
specifically for assessment purposes (Richmond, 1971). In

---

*Obviously, some of this separation is artificial and
introduced for rhetorical purposes. The observation itself
may occur by analysis posthoc, perhaps aided by video and
audio tapes. Some classrooms have more than one adult
available so that one can observe. Also, as Carini (1974)
points out, planning and reflecting on a day's activities can
reveal much about children's knowledge in itself.

all cases, collecting and searching for specific information,
the observer needs to be alert for something definitive, for
actions which seem to typify the child in the situation.
Over time, such hypotheses are documented,. modified and
enriched to form a picture of the child as a dynamic being.*

Environment

The sense of the classroom as a responsive environment
matched to and evolving with the skills and interests of the
children is an outgrowth of the theoretical conception of
growth.   Implications for the nature of the classroom can
begin with the basic principle of variety as stated by Turiel
(1969):

> A complex heterogeneous environment that presents
> a variety of contradictions is more likely to
> facilitate the equilibration process than a more
> homogeneous environment.
>
> (p. 130)

Surface appearance and the chronicle of activities will vary
from classroom to classroom given the individuality of
children's interests and development, the variety of
resources, materials and experiences they encounter, and the

---

*There is no denying the possibility of error in such a
format, especially of the pygmalion variety. The most
fruitful check is the inclusion of other observers, the use
of parent's information about their child, and the use of the
process over time. In some settings one may wish to employ
various standardized instruments as well, although their
reliability and worth is seriously questioned (Bussis,
Chittenden and Amarel, 1974).

high value placed on personally meaningful work.* The
following discussion completes the general description of
implications for the teacher's role and responsibilities by
describing features of the responsive environment.

In general, a responsive environment begins with
preparation to respond, with provisioning and structure built
around general baseline predictions of what <u>might</u> <u>be</u> concerns
of the children in question. The orientation is to expect
activity with materials. At the beginning and throughout,
this teacher function of provisioning the environment is
attentive to the child's current and evolving point of view.
Piaget (in Schwdel and Raph, 1973) summarized some of the
awareness about action and the qualities that the environment
must reflect:

> action is only instructive when it involves the
> concrete and spontaneous participation of the
> child himself with all the tentative groupings
> and apparent waste of time that such involvement
> implies. It is absolutely necessary that
> learners have at their disposal concrete material
> experience (and not merely pictures), and that
> they form their own hypotheses and verify them
> (or not verify them) themselves through their own
> manipulations. The observed activities of
> others, including those of the teacher, are not
> formative of new organizations in the child.
> (p. x)

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*A portion of the educational literature has always involved
documentation of particular classroom, children and teachers.
For teachers, this body represents a rich and growing source
of accessible illustrations of theory in practice. The works
often include discussions of principles as well and can
nourish reflection as well as suggest practices. The list is
long; some examples are: Mayhew and Edwards (1938) and
Schools Council (1972). In addition, Silberman (197)
reprints an excellent representative sample.

The initial provisioning structure took the form of a study of primitive cultures at the Dewey School (Mayhew and Edwards, 1938) and involved a focus on observation and representation. Many suggestions for curriculum are built around focusing on various themes: circus, blue, changes, water, etc. The key is that a responsive environment grows and changes from the general provisioning of an initial setting or orientation. The teacher comes to know the children more clearly and can more accurately respond to their concerns. The consequences of the children's actions and the outcomes of the teacher's direct and indirect interventions to confirm and stimulate experiences have the effect of transforming the environment into a tool and expression of the children's inquiries.

Often, the teacher's intervention takes place by means of the environment, by setting up a display, bringing in a new animal, setting an expectation or raising a question for discussion. Some observers (Nuffield Mathematics Project, 1967) have noted and recommended a pattern for stimulating children's thinking beyond initial explorations. The pattern is: (1) children's free exploration of the material, (2) introduction of vocabulary and dialogue (by and with the teacher directly or indirectly), and (3) emergence and attack of a problem by the children. The reader is referred to Episode 8 of this chapter for an example. The teacher has had a very direct role. It is possible that a group of the

children will expand into several extensions of their explorations of light and shadows.

Detailing some of the aspects of the very important teacher role outlined here is beyond the scope of this study; some of that work is done in the literature referred to earlier. It is important to note that, at base, the interactional theory does call for a very competent teacher who does influence children. As summarized by Piaget (in Evans, 1973)

> it is important that teachers present children
> with materials and situations and occasions that
> allow them to move forward. It is not a matter
> of just allowing children to do anything. It is
> a matter of presenting to the children
> situations which offer new problems, problems
> that follow on from one another. You need a
> mixture of direction and freedom.
> (p. 53)

Having discussed some general principles in an idealized context and manner, it is necessary to make a brief statement about how the preceeding and foregoing may be useful to teachers who do not currently espouse its basic tenets.

Sarason (1971) gives a grim description of a major personal and professional dilemma facing most teachers. Although teachers have long recognized that children act and react differently,

> teachers and other school personnel have
> inordinate difficulty in thinking other than in
> terms of covering X amount of material in X
> amount of time.
> (p. 153)

The inevitable consequence, Sarason continues, is that a teacher's day-by-day life is constantly buffeted by (1) knowledge that each child will not be adequately served, and (2) awareness that s/he, the teacher, is inadequately equipped to do very much about it. Each teacher arrives at personal resolutions, just as schools and school systems build means for supporting certain resolutions. However, if Sarason is correct, the basic concerns recur inevitably.

The discussion and illustrations in Chapter II and III and the experiences suggested in Chapter IV present a direction for addressing some of these dilemmas of teaching. Specifically, coming to understand interactional theory requires accepting that "the notion of a predetermined rate of development has become almost incredible" (Hunt, 1969, p. 123). In addition, as discussed earlier, implications of interactional theory, once accepted, lead to redefinition of the 'basics' and to reconceptualization of teacher responsibilities to reflect the goal of nourishing habits and abilities of experimentation (Furth and Wachs, 1974; Piaget, 1964).

No one even casually familiar with the course and history of educational change would suggest that the above represents a self-evident force which assures inevitable transformation of schools into responsive environments. However, if, as Sarason suggests, conventional schooling is frozen by its own tenets, and teachers are consequently

caught in a galling box, then approaches to enrich and
influence the belief system are needed. In this way, perhaps
regard and energy can be diverted from circular efforts about
curriculum and organization issues toward regard for children
and thence to how to provide "functional support for the
continuity of children's growth" (Weber, 1972, p. 62).

CHAPTER IV

EXPERIENCES FOR TEACHERS

> the existing evils in pedagogy, the prevalence of
> merely vague principles upon the one side and of
> altogether too specific and detailed methods
> (expedients) upon the other, are really due to
> failure to ask what psychology is called upon to
> do, and upon failure to present it in such a form
> as will give it undoubted value in practical
> applications.
>   (Dewey and McLellan, 1895/1964, p. 205)

> it is equally necessary to make our concepts
> sinuous (that is, to add to them the objects of
> immediate experience) as to make our immediate
> experiences intelligible (that is, to bring them
> under concepts).
>   (Kant, Critique of Pure Reason, introduction)

Introduction

This chapter describes experiences, experiments and
plans teachers can elect to undertake to stimulate, extend
and direct their explorations of interactional developmental
theory. A brief introduction sets a context for the approach
to teacher self-development. The next section of the chapter
lists and describes the several experiments and experiences
recommended to teachers. The final section of the chapter
discusses general conditions and plans as helping structures
for supporting the inquiring teacher.

Approach

These experiences are selected to provide teachers with close observations of children in action in ways that should reveal major features of the interactional theory. In addition, the author accepts teachers' propensity to elaborate educational implications and to focus their thinking on the professional setting. The plans in the chapter for using the experiences as well as parts of the descriptions recognize and encourage teachers to extend and apply their thinking in process in accordance with their judgment. In other words, the author assumes that teachers will work to apply that which they find worthy arising during their investigations.

Further, these experiences and plans are seen as elements that can support a teacher either beginning or intensifying a process of close reading and analysis of the theoretical literature. The intent here is to provide teachers with additional leverage for understanding.

The contents of the chapter, both experiments and plans, are derived from the accounts of numerous authors as well as from the author's experiences. The experiences are intended to be undertaken by teachers in their school settings. In addition, these recommendations are selected, presented and structured to encourage adaptation and extensions by the individual teacher.

Evidence of children's actions which illustrates the interactional theoretical principles and implications discussed in Chapters II and III may be masked, subdued or distorted in school settings which are structured according to alternative theories about development. Such non-interactional environments may serve to reinforce their habits, actions and attitudes. The problem is how to interrupt that cycle.

The experimenters and educators who advance educational implications for interactional theory ground their discussions in direct experiences with children. The suggestions in this chapter provide the teacher with some means to view evidence of children's interactional intelligence while remaining in their school setting. Weber (1972) has remarked on the critical and productive step of helping teachers come to view children differently:

> Teachers had to observe children as different before their understanding of this difference could grow. The child and his individual way of learning, his use of what is provided, the focus of his attention, is now visible. He has become accessible to observation by the teacher.
> (p. 65)

In the case of the Open Corridor program, some major alterations in classroom management and process were undertaken. This chapter identifies ways to begin to make children "accessible" to teachers' observation without the complications of curricular and instructional reformation. The possibility of setting these experiences in their own

classrooms provides a context for teachers to reflect on ideas and events against the constant field of familiar daily professional experiences.*

The focus of this dissertation and of this chapter, then, is practical means for allowing teachers to explore interactional developmental theory. The experiences in the following sections are suggested to generate information about children and development for teachers to examine. The area explored is children's thinking in the broad terms discussed in Chapter II. Dewey (1916) underscored the significance of such explorations to teaching and to teacher education when he stated:

> The sole direct path to enduring improvement in the methods of instruction and learning consists in centering upon the conditions which exact, promote, and test thinking.
>
> (p. 153)

Since the key aspects of the interactional theory are not currently major influences on what Sarason (1971) has called the school culture, it is prudent to suggest supportive conditions to assist teachers to experience the promise of the theory. In particular, the experiences in this chapter are designed to help teachers think about breaking away from their established expectations about

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*The author affirms that reconsideration and transformation of curricular purposes and instructional behaviors is ultimately necessary. However, such pedagogical matters must be accompanied and guided by and depend upon active and honest reconsideration of the nature of children's growth.

children and teaching.* As Flavell (1962) points out, for
the teacher to observe the key aspects of the theory
discussed in Chapter II requires:

> reorientation and acclimatization--a certain
> holding in abeyance of habitual ways of looking
> at things, at least until it all starts to come
> clear.
>
> (p. 14)

Such a process should also include opportunity for teachers
to clarify and test their own assumptions. Thus, the
exploration of a particular theory by the teacher can be
gathering of impressions and information as well as a self-
scrutiny of the teacher's current thinking. It is the intent
of this chapter to go some way toward making that process
possible. The task of Chapter V is to identify conditions
supporting the teacher-inquirer.

The following section of the chapter lists experiences
which a teacher might undertake, adapt and extend. Three
general categories are presented: (1) orientation to
childhood as a phenomenon, (2) the concept of child and adult
differences, and (3) the concept of experience as a growth
mechanism. The categories are loosely formed, and one
experience structure may provide a teacher with information
about more than one of the topics. Clearly, these are only

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*The problem of rigid preconceptions and categories is also
stultifying to fervent supporters of interactional theory.
Carini (1974) cites the example of the Piagetian advocate who
fixes grimly upon conservation of volume issues and never
sees a little girl gleefully splashing about in water.

examples and the participant-teacher would be encouraged to invent others and to adjust these to accommodate his/her purposes and the children s/he is investigating.

I. Childhood as a Phenomenon:

A. Simulations--Following is a group of experiences in which the process involves the participant pretending to be a child. The intent is both the trigger memories from the adult's actual childhood experiences and to simulate some aspects of a child's point of view. All of these are designed as experiences undertaken in a group context with discussion following to contribute to the effect. However, the experiences may be done by an individual, perhaps in connection with a reflection device such as a diary.

> Experience 1: Using wide-lined 'primary' paper and fat, eraserless 'school' pencils, the participant writes a brief composition about an important happening in his/her childhood. The right-handed person should write left-handed and _vice versa_. Silence during the writing is advised to promote focus on the process. (Many adults report physical fatigue during this brief experience, an interesting by-product for educators.)

> Experience 2: The participant plays a competitive board game which s/he played as a child but has not played since. Examples are: _Parchesi_, checkers, and _Monopoly_. As a variation, the participant may play the game with several different groups of children of different ages. Another variation is to play with a group of adults after or before playing with children.

> Experience 3: The participant plays alone with a toy or material conventionally associated

with and limited to children. Examples include: building blocks of wood or plastic, sand, jacks. A period of twenty or more minutes is suggested to allow for exploration in depth. A variation would be to limit one's senses, for example by blindfolding.

Experience 4: The participant (preferably in a group) takes the role of a child engaged in dramatic play. Sample situations include children playing: a visit to the dentist, 'house,' being lost in the forest.

Experience 5: In concert with experiences 1-4 and/or as a separate exploration, the participant is encouraged to have a snack. Some snack dishes might be: Kool-aid in small wax paper cups, saltine crackers, animal cookies. A particularly interesting snack, unfortunately difficult to locate, is the small wax bottles filled with a sweet liquid which are both sipped and chewed. A participant might also borrow a tin lunchbox and make himself/herself a lunch s/he remembers having as a child, e.g., plain bologna or thick peanut butter sandwiches, wrapped perhaps in waxed paper.

B. Children Solving Problems--Edward deBono (1974) has devised a simple process which provides some glimpses into children's thinking as they attack problems. Briefly, the child is asked to invent a solution to a given problem and to explain his/her solution with a drawing supplemented perhaps by discussion. Two types of problems are employed: (1) where there is a definite objective to be achieved to an obvious problem or deficiency and (2) where there is a more general problem or situation which is probably remote from the child's experiences. What is of interest is the child's idea and approach rather than the technical accuracy of the

drawing. The author finds the process notable because it samples, yet is not dependent on, children producing plausible responses or on their artistic or verbal proficiency. The participant should expect a wide range of responses from any one group of children. Some sample situations follow below of problems to be put to children:

1) Definite Objective Type:

Experience 6: "Show how you would stop a dog and a cat from fighting."

Experience 7: "Design a special bed for people who have trouble going to sleep."

Experience 8: "How would you find out how heavy an elephant is?"

2) General Problem Type:

Experience 9: "Design a fun machine."

Experience 10: "Invent a way(s) to improve the human body."

Experience 11: "If you were a policeman, how would you deal with a person who does something wrong?"

In reflecting on information from these experiences, the participant-teacher may find it helpful to begin formulating some hypotheses about growth and teaching that warrent further reflection and investigation. Some helping structures for that reflection are discussed in the section of this chapter on general conditions and processes.

II. Child Adult Differences:

This section lists situations teachers can arrange to explore some qualitative areas of their students' understanding. The intent is to provide information that suggests gross structural differences between child and adult thinking which the teacher may not have considered previously.* Detailed scrutiny of specific differences among children or of possible patterns to development are beyond the intended scope of this initial process. Except for a few examples, those experiments which Piaget and his collaborators have devised have been left out, although they serve many of the purposes of this section. It is felt that descriptions of Piaget's work are readily available; the reader is encouraged to augment the situations which follow with replications and adaptations of the work of the Geneva group (as reported in Brearly and Hitchfield, 1966: Richmond, 1971). These can be seen as model situations consisting of one or more objects or events and a request to act on or with them. The teacher may prefer to make use of similar situations which occur spontaneously in daily classroom experiences.

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*Some teachers may not consciously recognize or hold firm opinions about the nature of adult thinking. To provide focus and contrast, it would be useful to: (1) do some of the experiences with adults as well as with children, and (2) record expectations and moments of surprise when undertaking the experiences with children.

Experience 12: The child is asked to examine a
plain chocolate bar in a sealed transparent
bag. The teacher or child then breaks the
bar into several pieces without breaking
the seal. The question is asked: "Is
there more chocolate to eat now, less
chocolate to eat, or the same amount?" and
further, "How do you know?"

The teacher should take careful note of verbal and

nonverbal responses and cues to what the child believes and

how firmly the beliefs are held. Nearby, there might be

measuring devices to use if the child asks or perhaps used by

the teacher to help clarify a child's line of thinking.

Additional chocolate bars would also be useful. (Of course,

the intent here is not instructional or to demonstrate the

adult's answer to the child.)

Experience 13: Small objects and substances are
sealed in small brown paper or other opaque
bags, one item per bag. The child is asked
to guess what is in each bag after
exploration but without opening. Three or
more different bags may be employed in each
exploration of approximately five to ten
minutes.

The teacher should observe exploration strategies, in

particular: varieties of senses used, ideas being tested,

persistence. A discussion after the guessing could probe for

the justification behind a child's idea. The bags can be

opened or not at the teacher's discretion. Some interesting

further information about children's thinking over time can

follow leaving the sealed bags in the classroom available for

further exploration for a month or more. Examples of objects

and substances include: salt, a paper clip, a magnet and

metal bar, a marble, an eraser, a tooth.

Experience 14: In a variation on the above, the
teacher brings one large sealed bag with
something inside for exploration during the
day and guessing and discussion at the end
of the day. Repeated regularly, perhaps
weekly, this experience can generate
observations about children's ·thinking over
time. In particular, a teacher may begin
to sketch some patterns in individual and
child development and functioning which s/
he could explore further.

Some experiments can be verbal; although it is

important to note that the following two (15-16) are tied to

concrete settings.

Experience 15: This activity is similar to the
game "20 Questions." One person (teacher
or child) thinks of a specific something.
The other player or players attempt to name
it by asking questions. The 'thinker' must
respond truthfully either yes or no to each
question.

Experience 16: A variation on the above game
focuses the exploration by limiting the
initial field. For example: "I'm thinking
of a bird." or "I'm thinking of something
big." Another kind of limitation can be
achieved by specifying the maximum number
of questions allowed.

By beginning the game with no limits on questions and

the vague 'something,' there is opportunity to observe a wide

range of concepts and categories the child may apply as well

as a wide field to observe the child's strategies. It is

possible that the limited situations may allow the child's

level of specific information about birds to obscure his/her

approach and understanding. A compressed number of questions

may not adequately engage the child's optimum thinking. A

teacher may wish to employ both methods. The teacher will

also want to experiment taking the different roles - thinker, questionner, and observer.

> Experience 17: This problem involves building a tower (B) from blocks equivalent in height to another tower (A) already built. Tower B must be built on Table B which is adjacent to but lower than Table A which holds Tower A. Numerous blocks and measuring instruments should be readily available. The child may not move his/her Tower B to check for accuracy until s/he is finished (although s/he may build an equivalent Tower B that may be moved).

From time to time during the activity, the teacher might ask the child to verbalize what s/he is doing. These verbalizations may provide clues which the teacher can pursue in understanding the child's thinking (Piaget, 1953).

> Experience 18: This situation provides explorations of structural and ethical thinking. Either pairs or paired small groups of children may participate. First, the teacher constructs a block construction from several shapes and conceals it behind a screen in the classroom. Then, two piles of blocks (A and B) are placed in the room such that neither pile contains all the blocks necessary to reproduce the teacher's construction, but pile A could complete with a few added from pile B and vice versa. Each child from the two groups (A and B) is allowed to study the teacher's construction behind the screen for a timed interval of sixty (60) seconds. The instructions are given: "Each group is to build a copy as quickly as you can. During the building, any one group member may study the model behind the screen for one minute."

Experience with this problem suggests that the teacher might expect the building and subsequent discussion to take one hour or more, especially if all or a large portion of the

class has been participating. Some of the issues that often arise (cheating, cooperation, giving up, and leadership, as examples) have generated heated discussion. These may complicate the teacher's opportunity to observe and examine the children's thinking. Assistance from other observers and/or from audio-visual recorders would be useful.

The next seven experiences are specifically intended to show ways to reveal and explore aspects of children's thinking which many adults label as heavily illogical and subjective. They follow in the main the classic Piagetian form of testing the child's ability to resolve surface appearances with a concept s/he may or may not possess.* Generally, one concept is selected for inquiry, for example, children's ideas about length, substance, number, or space.

Experience 19: Show the child six roses and an assortment of six other flowers. After checking whether s/he knows them all to be flowers, ask: "Are there more roses or more flowers?" and further: "How do you know?"

(Piaget, 1972, p. 2)

Experience 20: Spread twelve or so buttons flat on a table, then scoop them into a cup. Ask: "Are there more buttons now (in the cup), are there the same, or are there fewer?" and further: "How do you know?"

Experience 21: Display two straight pieces of wire parallel to each other approximately 4

*Numerous experimental situations are described throughout Piaget's work. Piaget and Inhelder (1956) is particularly rich in examples. Brearly and Hitchfield (1969) have compiled an impressive group of quotations from and descriptions of experiments from many of Piaget's early work.

inches long: "Are they the same length?"
If the child agrees, then move one piece
approximately 2 inches along the parallel:
"Is this one (the one moved) still the
same; is it shorter; or is it longer than
that one?" and "How do you know?"

Experience 22: With the same two lengths of
wire, establish that they are the same
length. Then bend one to approximately 45
degree angle: "Is this one (the one bent)
the same length now, is it shorter, or
longer?" and "How do you know?" This can
be continued by bending the wire straight
again and asking about length.

This experience involves a very useful piece of
equipment which teachers can make easily--the pan balance.*

Experience 23: Two balls of clay or plasticene
are demonstrated to balance. The child is
asked whether they both have the same
amount of clay. If s/he agrees, one ball
(A) is then rolled into a cylindrical
shape: "Now, does A have more clay, the
same, or less clay than B?" and "How do you
know?" The balance should be used to check
predictions.

This situation lends itself to probing questions like:
"How could you make it the same again?" "Could you do
something to the clay to make it not balance (or balance)?"

Experience 24: The child is asked to draw a map
showing how to get from one familiar place
to another. Possible topics include: from
bed to kitchen, from classroom to bathroom,
from classroom to playground climber. The
intent is to examine both the child's
approach and the content of his/her map.
Measuring devices and straight edges can be
provided, but free hand drawing will
suffice. There is no need for the teacher
to expect or encourage pinpoint accuracy.

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*The Educational Development Corporation, 55 Chapel Street,
Newton, Massachusetts 02160 can supply plans.

Experience 25: A variation on the above asks the
child to build a map three-dimensionally,
using perhaps blocks and toy people and
houses. The problem can be to make a map
of the classroom itself, of the child's
home, the school playground, a favorite
place.

Asking the child to guess what will occur before an
action like bending or moving an object could greatly enhance
the information the teacher receives from the above
experiences (19-25) as well as from many of the other
experiences recommended in the chapter. Also, wherever
possible the teacher should allow the child to freely explore
the materials before beginning an experiment and have the
child do whatever manipulations required during the activity.
This should help make visible the child's ideas as s/he acts.
For a moment, the teacher must remember that his/her intent
is to observe and not to lead the child toward any particular
answer.

III. The Concept of Experience:

The following experience situations are adapted from an
evaluation strategy developed by Carini (1974) as a means to
monitor the impact of school experiences on children over
time. In particular, these situations sample the child's
flexibility of thought and his/her dependence on and ability
to use past experiences in problem solving. For purposes of
this dissertation, they are suggested as structures which may
reveal some of the range and dimensions of thought in
children.

Experience 26: The child is asked to draw a
solution for the problem: "How would you
get to the other side of a wall which has
no door?" The teacher observes and records
in the same manner suggested for
Experiences 6-11, page 95. Then, the
teacher asks the child to think of as many
other ways to do it as s/he can within 5
minutes.

Experience 27: In the same format as Experience
26 above, the child is asked to list
everything s/he can think of to stand on in
order to reach a can on a shelf 2 feet
beyond his/her reach.

These two experience situations and others analogous to

them (for example, see the illustrations in Chapter III)

should generate lists of children's solutions. The teacher

can then look for patterns and categories of answers for one

child and with many children and perhaps trace lines of

logic.* Specific similarities and differences between

children's and adult's thinking may emerge as well as clues

to how children use information. This kind of experience

situation serves as a bridge to the next section of the

chapter which lists activities to explore the interactional

concept of experience.

As discussed in Chapters II and III, experience can be

thought of in both long and short term ways. Equilibration,

that is major developmental transformation, is not usually

dramatic or instantaneous. One of the features of the

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*Carini (1974) and co-workers have developed continua of
thinking processes as screens for these data. Their work is
part of on-going efforts to develop more reliable and useful
evaluation tools.

theory, in fact, is that it views the conventional elementary school years as encompassing primarily just one major stage.

However, the teacher can witness a child extending an understanding from one area into new areas. The teacher can observe children in spontaneous problem-solving and observe children encounter consequences to their purposeful behavior. The teacher can observe adjustments a child invents. The following situations are structures to give teachers access to the personal, internal, interpretive, constructive, experiential process children undertake in constructing and using knowledge. In addition, the experiences are intended to suggest to teachers that manifestation and insight into a child growing and developing comes in the child's active problem solving.

> Experience 28: The activity is "Guess my rule."
> Needed equipment includes a large pile of
> similar objects; a good example is a
> hundred or so buttons, some with four
> holes, different kinds of bumps, colors,
> shapes, and so on. The first player (child
> or teacher) decides privately on a rule
> (for example, "has four holes and bumps")
> and displays a button that fits his/her
> rule. The other player or players attempt
> to guess the rule by asking whether certain
> buttons fit the rule. The first player
> (the rulemaker) must respond truthfully
> until someone guesses his/her rule.

It is helpful to keep separated and in view each button asked about in two groups: "fits" and "doesn't fit." A good procedure also is to require that players take turns guessing or for there to be two or three seconds between guesses.

The next structure is a variation on the above which simplifies the task somewhat.

> Experience 29: Provide a group of objects
> dissimilar in only one attribute except for
> one object which differs in two ways. For
> example, have red and blue pencils with one
> red pencil having a blue eraser. Ask the
> child to put the objects into two groups
> that "go together." Then, try some probing
> questions to determine how the child
> perceived and resolved the unusual pencil.
> (See Episode 16, page 64, Chapter III.)

Usually, these experiences expose elements of interaction. Within the limited environment of objects, attributes and information from guesses, each person builds a possible rule. In the button game, in particular, as the game goes on, the player adjusts and rebuilds to fit new information from guesses. Changes and patterns in children's guesses can often suggest the strategies and rules as they are being constructed. Audiotapes and transcripts would be particularly useful to retrieve activity for analysis and reflection.*

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*Of course, the structure is not clinically precise. A child may be distracted by social or emotional factors. Sometimes a child (or adult) seems to be randomly guessing without hearing answers at all. Such may be the strength of his/her conviction that s/he ignores contrary evidence. Perhaps s/he has developed only primitive problem-solving tools. The teacher might play the game with that person with only 3 or 4 varieties of buttons to see if the first 'universe of buttons' was too rich.

The next three activities (30-32) involve pattern-copying to reveal sequences of attempt-consequence-adjustment-reattempt.*

> Experience 30: A simple pattern made of three or four shapes (triangle, square, circle, and so on) is posted in the room with matching loose pieces nearby. The child's task is to replicate the given pattern. The teacher can complicate or simplify the task by the number of variables put into the pattern (shape, color, number, for examples).

> Experience 31: The activity is to reproduce outlines with blocks or given cardboard or plastic shapes. Outlines of various geometric or other realistic and abstract figures are provided along with the requisite component blocks. A good example of this refined puzzle process is the commercially-available Tangram game.

> Experience 32: The equipment involved is a square or other rectangle of at least 1 square foot made from heavy cardboard, plywood or other similar material. The figure should be cut into several regular pieces (at least seven or eight in number). The child's task is to reassemble the figure.

The next structure involves children's moral reasoning and often provides examples of differences in child/adult thinking as well as examples of the thinking-knowing process.

> Experience 33: The child is presented with the dilemma: In a remote village a man's wife

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*Some children experience difficulties with visual, motor or coordination aspects of these activities. To the extent that they still are intent on solving the problem (in the observer's judgment), information about interaction can still be inferred when they are given help with the physical difficulties (or the task can be modified).

is near death from a rare disease. Doctors
say nothing can save her life except a new
medicine invented by a local drug store
owner. The owner wanted much more money
than the husband had. The owner also
refused to give or loan the husband the
medicine; so the husband broke into the
store, stole the medicine and gave it to
his wife. He was arrested by the police
right away. Was the husband right to break
into the store?

The teacher-interviewer should be prepared to probe for

the child's reasons for his/her answer: Was it right for the

owner to charge a very high price? What if the husband

didn't like his wife very much? Would you have done that?

This dilemma and others like it* often generates

striking examples of resolutions happening between the

external demands of the problem as understood by the child

and the internal beliefs s/he holds. Sometimes the child

responds after a clear struggle to connect what s/he knows to

a very difficult situation. Sometimes, there is little

response or fixation on one piece of the situation (the

broken door in the store, for example) indicating that the

child has engaged the setting in only limited ways.

Experience 34: The introduction of an open-ended
or plastic material into the classroom
(e.g., sand, water, or clay; similar
stimulation often obtains from introducing
animals such as fish or gerbils into the

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*The interested reader is referred to Kohlberg (1971). Many
adults, the author included, have been astonished to hear a
seven-year-old solemnly condemn a wife "because you shouldn't
steal" or to hear a ten-year-old seriously expound on the
virtues of protecting one's wife "so she could do the dishes
and make lunches."

classroom environment). The teacher should
be sure that time and permission are
clearly available for students to explore
the new material (during a choice period or
after completing certain other assignments,
for example). A broad task such as "Find
out something about the clay" should be
set. In addition to recording what the
children discover, the teacher can observe
how the children interact with the
possibilities and limitations of the
material. Also, such a situation often
provides examples of social interaction
injecting consequences and influencing the
possibilities of a child's exploration.*
One child may be creating an understanding
for himself/herself that happens to be
identical or counter to that announced
earlier by another child unbeknownst to the
first child. The teacher may wish to
experiment with observing single children
in relation to the material versus other
children in groups.

Finally, the teacher-inquirer is urged to reflect on

the earlier experiences (1-27) suggested for exploring child/

adult differences. Rethinking, repeating, and/or adapting

some of them should also yield information about the

processes of interactive experience.

The author underwent such an experience when working

with the experiment with the two balls of clay (Experience

25, p. 101). The boy, who was ten years old, predicted

that the ball rolled into a cylinder would be lighter and

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*It is useful to observe that even such a highly stimulating
material as those mentioned do not unfailingly engage all
children, nor do all children show interest in the same
aspects of a material. Equally, the approach outlined is not
necessarily appropriate for using these materials as
instructional tools; the purpose here is more theoretical.

that its pan on the balance would go up.* When that did not
in fact occur, he was asked whether he thought he could do
anything to the clay to make his prediction come true. He
proceded to flatten the clay on a table, making it thinner
and flatter, occasionally checking the balance. He was swift
and deft as he worked, clear in purpose and approach. After
several failures, he was asked whether perhaps nothing could
make the clay lighter. "Oh no," he said, quite seriously,
"if I had a bulldozer, I could smash it out real thin and it
would work." At each of his successive trials with the
balance, his confidence had diminished that this particular
attempt would prove out, yet he recast his thinking beyond
the limitations of the present equipment to adjust the
consequences he saw to what he <u>knew</u>, bringing in his
knowledge about bulldozers for support. In addition to the
particular content of the boy's thinking, the author was
intrigued by the process of acting and rethinking that seemed
to be occurring.

IV. Approaches for Using the Experiences:

Some examples of general plans for using the
experiments follow. They are intended to combine entry into
interactional theory with addressing other educational
concerns. As a teacher reviews various structures, s/he can

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*The same boy later used a balance sensitively and surely to
grade by weight a variegated group of over twenty common
objects.

select issues of particular moment to him/her. It is at this

point that the situational and personal needs of the teacher

become paramount. Thus, the author recognizes that the

following must be an incomplete listing of tentative outlines

rather than a collection of complete blueprints. In

addition, detailed scenarios and field testing have been

deferred for later studies. The following, then, termed

'plans,' are suggestions for different foci of effort for

using the experiences in the Chapter.

Plan 1: Focus on the Teacher as Learner

Concurrent with undertaking the experiences with
children, the teacher seeks out a learning project for
himself/herself, e.g., pottery, automobile repair, study of
English novels, etc. Over time, the teacher keeps a log and
reflects on such questions as: "What do I know to be
necessary of myself as learner?" "What do I know to be
necessary for children?" The teacher is especially alert for
parallels emerging in how s/he seems to learn compared to how
his/her students seem to function in the experiments.

Plan 2: Focus on Examining Work and Play

Since one can arrange a school setting to mask many
aspects and perhaps the totality of children's thinking, the
teacher decides to observe primarily spontaneous, child-
initiated activities. S/he observes playground, after and
before school settings, beach and other recreational areas.
S/he deliberately attempts to check prior expectations and to
find examples of exploration and consequence. Also, the
teacher undertakes the experiences in the Chapter which are
least adult-dependent. Very likely, the teacher will begin
formulating hypotheses to test about work and play and should
analyse his/her classroom in the light of the tentative
conclusions that suggest themselves.

Plan 3: Focus on Developmental Differences and Continua

The teacher selects one or more aspects of classroom
life which can vary. Examples include the relationships of
teacher and student, child and child, and child and
material. The teacher develops and states continua and

criteria to describe the range of variability s/he understands to comprise the variable. Then, after doing some of the experiments in the Chapter, the teacher screens the information gathered through the continua s/he developed. This process should help the teacher evaluate expectations as well as reflect on developmental processes.

For example, a teacher might express child to child relations as varying along a continuum from coercive to cooperative. Before doing Experience 28 ("Guess My Rule") with a particular group of five children, the teacher predicted that a certain child would dominate and force the other's to accept her ideas. However, when done, the group shared leadership and built on several members' contributions, each child clearly constructing ideas. On reflecting, the teacher felt that the activity was a compelling challenge to each of the children so that none would let the habitually bossy child take over.

Plan 4: Focus on a Single Narrow Area

The teacher selects on explicit target, e.g., intensive scrutiny of children's understanding of number facts to ten. S/he builds a rationale and educational strategy, predicts progress, documents and evaluates, using her best professional wisdom. Simultaneously, s/he selects those experiments in the Chapter as well as others which relate to the goal of better understanding the focused target. In the given example, Experiments 12, 13, 17, 19, and 20 relate directly to the area of understanding number. By combining and comparing his/her information from the teaching with the information from the experiments the teacher should be able to draw tentative conclusions, generate directions for further inquiry and clarify his/her theory.

Plan 5: Focus on Teacher Behaviors

The teacher decides to examine his/her behaviors. For example, s/he may wish to examine the use of probing questions ("Can you show another way?" "How do you know?" "What does that remind you of?"). In the experimental situation, in the classroom, or in both, with the aid of an audio or video recorder, the teacher can witness what s/he says and what happens before and after. Similarly, study of use of silence, room arrangement, decision-making, and other teacher behavior variables could be made within the context of the experiments. Also, the experiments provide structures and information to try out intended changes in habits. The teacher might then decide to expand the scope of certain behaviors to the classroom in general.

Plan 6:   Focus on Documenting a Single Child

The teacher decides to describe as completely as s/he can one child over time. Using the experiments as a basic framework, the teacher adds whatever other inquiries to build an on-going assessment of the child's strengths, styles, interests and difficulties. Perspectives from other observers could be used to enrich the picture. This plan takes on particular force when continued over time, so that dawning powers are traced and patterns are clarified.

Plan 7:   Focus on Documenting One Child developing along a
          Single Dimension

The teacher scrutinizes one child over time (probably several months at least) with prime attention on one area of growth, e.g., moral reasoning, logic, reading. As the teacher uses the experiments and other means to collect data, s/he also reflects regularly, building hypotheses and drawing tentative conclusions and implications. Special attention should be paid to keeping documentation and to frequently reviewing the total information so that patterns and trends can be seen, proven or denied.

Summary:

Thirty-four experience structures and seven planning

foci have been described in the chapter as tools for

enhancing teachers' inquiry into interactional theory.

Suggestions of ways for teachers to conduct the experiences

and for the kinds of information that may develop have been

included as appropriate in the descriptions. Chapter V

continues the discussion by adding recommendations for

conditions and processes to support the inquiring teacher.

CHAPTER V

TEACHER EDUCATION, DIRECTIONS
FOR FURTHER STUDY, AND SUMMARY

These three circumstances: the limited
significance of much of the research that is
carried on; the tendency to ignore in practice
pertinent theoretical evidence; and the failure
to respect theoretical ideas that emanate from
the actual setting suggest that research and
development must occur on an interactive
continuum.
                    (Parker and Rubin, 1966, p. 43)

'Conditions' are always moving, they are
always in transition to something else. The
important question is whether intelligence,
whether observation and reflection,
intervenes and becomes a directive factor in the
transition.
                    (Dewey, 1962/1929, pp. 144-145)

The organizing center of this dissertation has been the

goal of suggesting means for teachers to influence their

beliefs about children's development and about teaching. The

discussion has proceeded from two assumptions which have

provided both resources and focus: (1) that the

interactional developmental theory associated with the work

of John Dewey and of Jean Piaget has important implications

for education; and (2) that teachers themselves must interact

with basic theoretical ideas in their professional contexts,

making personal decisions about worth in the light of their

own experiences. In this study the particular theory guides

the development of the approach recommended for blending the

perspectives of teacher and theorist; a kind of harmony is

intended. As Benne (1950) points out:

> (Dewey's) thoroughgoing attempt to apply the
> principles of democracy to processes of
> education, with the derived principle that
> learners participate cooperatively with teachers
> in determining the ends and means of their
> education, is at least as much at home in
> processes of adult education as in the education
> of children.
>
> (p. 74)

Chapters II and III have outlined broad features of

interactional theory that are of major educational import

suggesting the scope of redirection implied were the theory

to guide educational practices and development. Chapter IV

has described specific activities for classroom teachers to

undertake to enhance their exploration of those major

features. In the following pages of Chapter V

recommendations are given for supporting the inquiring

teacher and for areas needing further study and development.

I. Professional Growth for Professional Teachers

    A. The Role of Teacher

    The dissertation assumes that major alterations in the

societal conception of the role and respectability of

teaching must accompany implementation of the approaches

recommended. There is a tension and dynamic extending beyond

the schoolroom door that must be recognized. On the one

hand, as Piaget (in Hapgood, 1975) so clearly summarized:

> for the most part, the schoolteacher is not
> thought of, either by others or, what is worse,

> by himself, as a specialist from the double point
> of view of techniques and scientific
> creativeness, but rather as the mere transmitter
> of a kind of knowledge that is within everyone's
> reach. In other words, it is considered that a
> good teacher...is in possession of a general
> elementary education and has learned a few
> appropriate formulas that enable him to inculcate
> a similar education in the minds of his pupils.
>> (p. 51)

On the other hand, it is becoming more and more clear that
there are far more variables influencing children and
teachers than supposed, that classrooms are far more variable
than supposed, and that the teacher has much more potential
influence over conditions than supposed (Weber, 1972;
Sarason, 1971). Rather than expending energies primarily on
curricular or organizational matters which are secondary, the
key to improving education is the instruction, which means
the teacher. As Sergiovanni (1975) states, writing about
school administration and leadership, the realization must be
made that

> (i)n the final analysis, it is what the teacher
> decides to do day by day with students in the
> classroom that really matters and this daily
> encounter must be the focus of change. If we
> fail to reach this daily encounter, we have dealt
> only with structural change but not internalized
> change.
>> (p. 6)

It seems incredible that what seems a truism needs to be
stated as the cornerstone of his description of the way to
think about change to a professional audience of school
leaders. Such is the separation of sense and reality that
characterizes too many of our schools and plans for growth.

B.   Some Commentary on Teachers

There is a nascent movement toward professional
training for teachers which is geared to influencing their
beliefs as well as to equipping them with technical arsenals
(Combs, 1971; Smith, 1975). The following summarizes the
basic principles of this approach, which is the context
required to make effective the experiences and
recommendations in this dissertation. The reader is referred
to the citations for more thoroughgoing discussion of this
approach to professional growth for teachers.

The basic posture is that teachers' beliefs about
teaching and children affect and form their practices (Elvin,
1950) and that teachers, like all humans, are potentially
open to altering and refining beliefs in the light of
convincing experience. Arthur Combs (1971), a major
developer and proponent of this approach, summarizes the
implications for teacher education:

> In the important events of life we are governed
> by our beliefs, our values, our understandings
> and the things we think are important. To be
> sure that our professional workers behave
> effectively, then, it is necessary in the course
> of their training to provide them with
> opportunities for discovering personal meanings
> which can be effective guides for the moment to
> moment behaviors they will be called upon to
> engage in during the course of their professional
> experience.
>
> (p. 9)

The same conception holds for inservice and preservice
teachers and leads to the earlier statement that change must

be seen as change in what the teacher believes as well as does. Further, the approach recognizes that such change by a teacher is ultimately intensely personal and individual in nature, involving as it does the core of the teachers' ideas. Considerable participation must come from the teacher. As Thelen (1954) bluntly states:

> Teaching is what the teacher does. To change teaching means that the teacher himself must, in some respects at least, change. And only the teacher can change the teacher.
>
> <div align="right">(p. 73)</div>

C.   Two Necessary Conditions: Voluntarism and Support

The details or surface appearance of activities which involve inquiring teachers will vary greatly depending on such factors as: (1) the context (preservice or inservice; school, university, and/or other); (2) the individuals and organizations (the skills and knowledges already possessed; the histories and dynamics of relationships and habits; the available resources); (3) the tactics employed (problems addressed; quality of design and execution; attention to detail); and (4) outside or secondary forces (for example, political turmoil from school integration, tax levies, war, a teacher strike).

At the same time, two features, voluntarism and support, characterize the deep structure or nature of activities which involve teachers in the intense reflective personal inquiry described earlier in the chapter and implicit throughout the dissertation. These two conditions

or features are described briefly below and are further amplified by means of the recommended guidelines for inservice experiences reported on immediately after.

Voluntarism. This idea is too often taken to mean that teachers (or children) ought to be allowed and encouraged to do whatever they like, or nothing, willy-nilly. Such is not the position advocated here. It is perfectly appropriate and necessary that the profession (or that a professional setting) expect its teachers to engage in intensive professional growth experiences and to demonstrate the worth of their activities. Nor is it stifling that a setting require that the teacher make contributions to the development of the particular organization toward a more professional setting. It is necessary that the teacher have a wide range of alternatives, major decision-making opportunities, and knowledge that wide variations in the outcomes of his/her activities are tolerated and encouraged. The condition of voluntarism is evident when teachers have a high degree of responsibility for initiating, planning, directing, evaluating and acting on their professional growth experiences.

Support. Although often restricted to refer to an occasional word of praise perhaps tied to monetary rewards, support for inquiring teachers is a much wider concept. Support encompasses all that others can do to supply some energy to a teacher engaging in a technically and psychically

demanding process. Doing something that would change his/her perception of children and of self and role is not easy for a teacher - or for anyone else. The teacher needs advice, encouragement and acceptance.

The role of resource person or advisor is one gaining increasing attention. An example of how one advisor provided support to a teacher follows to illustrate:

> So right from the start I say there is not one right way, and make them look to themselves for a few decisions. With those decisions made, we look at child groupings and teacher role, and try out several alternative ways of organizing materials, space, and time. Because of so many decisions to be made, that must be based in the teacher's own purposes, it is best for him to think of a time line of two or three years.
> (Collins, in Devaney, 1974, p. 104)

Clearly, this advisor conceives of supporting by giving help that increases the means for the teacher to control and continue an agent of his/her own learning.

University-based supporters can function well as mentors, designing courses and programs that depend on classroom inquiry and expecting and fostering teachers' probings for meaning in their activities. By modeling unfamiliar modes of thinking and leading a teacher to trace connections among events and experiences, for example, these resource persons can help realize the promise of the experiences recommended in Chapter IV of this study.

Effective support from supervisors and other administrators is especially critical because of the

constricted role relationships and distrust of
experimentation prevalent in most systems. These individuals
should become especially alert to fostering teachers'
initiatives and must expect new problems, incomplete
successes and slow rather than dramatic and tangible results.
Their conviction and active participation can be particularly
supportive.

Equally important, perhaps most critical, are the
support possibilities in the connections among a small group
of teachers sharing their inquiries. It seems unlikely that
a single teacher could continue in isolation for very long in
major questioning of pedagogical purposes and methods, still
less that s/he could accomplish much redirection of his/her
work. Lillian Weber's work (1972) over several years in New
York City is instructive:

> In every instance, the unit of change was a piece
> of the school, usually four or five classrooms...
> One teacher's proposals for change could be
> ignored. The teacher might even be persecuted
> and reduced to frustrated conformity.
> <div align="right">(p. 62)</div>

D. Inservice Teacher Education Programs: Guidelines

Support and voluntarism are conditions which can
contribute to teachers' sorting out of significance and
implications of new ideas within the ebb and flow of daily
professional experiences. An application of these conditions
to the field of inservice teacher education program design,
maintenance and evaluation was done by Linda Welles (1976).

Her work is based on a thorough review of the literature and an analysis and evaluation of an exemplary program--The Integrated Day Inservice Growth Program at the School of Education, University of Massachusetts in Amherst. As part of her work, she synthesized into seven guidelines the suggestions and experiences the authorities in the field have found imperative to effective inservice teacher education. The guidelines state that

- Teachers' differing needs and abilities should be considered in the design of inservice programs.

- Teachers should be involved in decision-making at all phases of the design, implementation, and evaluation of inservice programs.

- Valuing and fostering the teacher as experimenter, problem-solver, inquirer can contribute to effective inservice processes.

- Reflection is a crucial process in making rational change in attitudes and behavior; inservice programs should provide conditions conducive to reflection.

- Professional growth of teachers must be sought in the context of their unique professional setting with particular attention to the group or groups which can support their change efforts.

- Administrative support from the teachers' school district is essential to the effectiveness of inservice activities contributing to the professional growth of those teachers.

- Inservice programs should build upon processes which facilitate self-renewal.

(p. 36)

With technical details and tactics developed according to the context, individuals and organizations involved, and the resources available, these guidelines are applicable to preservice program design, to university courses, staff development activities within school systems, to demonstration projects, to teacher centers, and to the other activities intending to promote teacher growth and educational development as it has been conceived in this dissertation. The guidelines serve as summary for this part of the chapter.

II. Recommendations for Further Work

These recommendations will be confined to the field of educational theory and practice, recognizing that what is properly theory and practice in education and what is not are debatable and ill-defined. Certainly both Dewey and Piaget themselves participated (and are participating) actively in on-going basic research. For present purposes, the author shall only say that the basic principles of interactional theory themselves are worthy of inquiry as well as debate and that the theory seems to continue to inspire hypotheses for investigation (e.g., the work of Kohlberg on moral development).

Both basic and applied research and development are needed. There are major tasks for education and society waiting to be defined and engaged in this time of change and doubt. In such circumstances as ours, Dearden (1968) notes,

> It is precisely the general evaluative criteria
> of what is 'good' which need attention if the
> constant flood of recommendations and of advice
> from all sides is to be sifted, assessed and
> intelligently adapted to local circumstances, and
> if a coherent and concerted programme of
> activities is to be evolved.   .
>
> (p. 10)

A.   One area of basic research needed that should be mentioned is inquiry into the inferred process of mechanism of <u>equilibration</u>. That is, can evidence be gathered to pin down more precisely which aspects of environmental phenomena interact in what manner with which aspects of internal processes? Can there be 'critical periods' or governing influences identified to match the observed patterns in development? What discernable chemical/electrical factors may there be involved? How may they be found or influenced?

B.   There is ongoing work that must be continued in developing more sensitive and useful <u>tools</u> <u>for</u> <u>evaluation</u> of teachers and school habits. An example of this work is Carini's discussion (1975), <u>Observation and Description: An Alternative Methodology for the Investigation of Human Phenomena</u>. The work is in its infancy with focus and support provided by the North Dakota Study Group on Evaluation and by the Educational Testing Service. The goal is to develop means to reliably describe the complex web of school activities in such a way that variables like teacher and student behaviors can be separated and related to identify patterns and analyse consequences. Such capability could

make far more detailed studies possible than at present. For example;

    C.   Longitudinal studies of

    1.   single children over several years, describing development matched with various school practices;

    2.   groups of children over several years, perhaps tracing social influences on development;

    3.   planned change activities and processes in schools;

    4.   various categories of intentional schools, where documentation of process and consequences of attempts to articulate and implement a coherent educational environment can be compared;

    5.   similarly, studies of development of children who experience various early childhood or other schooling models and what occurs to them.

    D.   Specific studies should be done to examine the impact of the methods and approach to teacher/theory encounters discussed in this dissertation. For example, studies should be done:

    1.   to compare congruence between teachers' beliefs and those of interactional theory before and after/with and without these experiences.

    2.   to compare teachers' ability to articulate their own beliefs about teaching and child development before and after/with and without these experiences.

    3.   to follow preservice teachers with and without these experiences into the profession and find whether relationships between teaching behaviors and professional growth habits exist and persist.

4. to determine whether the experiences can be correlated with focus on and/or change in teacher behaviors.

5. to test the underlying rationale, that is, perhaps forcing teachers to participate in these experiences has positive effects, and the notion of voluntarism is nonexistent.

6. to test whether the concept of support can be refined to specify especially important aspects, or whether matching conditions between certain teachers and certain support activities can be predicted.

E. Studies are needed of the degree of congruence between teachers' avowed beliefs and those evident from their practice. Perhaps experience with the approach in the dissertation can be demonstrated to increase teachers' ability to accurately identify the theoretical underpinnings behind certain child behaviors or teaching practices.

The last four recommendations are in the area of program development and dissemination of information to the profession, a very large topic which can be touched on only briefly here.

F. Several well documented demonstration schools should be selected to receive intense scrutiny and publicity in the professional and public media. These should be representative severally of different educational ideologies. As means for effective development of a theoretically coherent and effective school are identified, study should begin to identify how to supply all the nation's schools with such means.

G.   Means by which schools make use of resource persons in supporting teacher growth should be documented, evaluated, and publicized.

H.   Experiments such as the four-day·student week and the year-round school should be scrutinized and publicized to ascertain possibilities of supporting teacher inquiry as well as to their economic virtues.

I.   Efforts should be increased within the local and national professional teacher organizations

    1.   to support experimentation by fellow teachers,

    2.   to gain control over training and retraining processes, and

    3.   to identify processes to locate and relieve incompetent teachers and administrators.

III.   Summary

This dissertation has presented processes and experience structures to outline means and directions for teachers to undertake an exploration of interactional developmental theory. Chapter I, in setting the problem, identified the teacher as key participant in any appraoch to significant reform of schooling. Chapter II reviewed the interactional theory, describing key features of child/adult cognitive differences and of the concept of experience. Chapter III further described the key aspects of the theory from an educational perspective with illustrative episodes of children's behavior. Chapter IV presented thirty-four

possible experiences for teachers to undertake with children
in their own settings to deepen the teachers exploration of
the theory. Chapter IV also suggested seven planning
strategies to help the teacher select experiences and
organize information generated according to purposes
significant to the teacher. Chapter V has further described
the approach to fostering teacher inquiry with a discussion
of necessary conditions of voluntarism and support; the
conditions were further described by a report on seven
guidelines for inservice programs which could be adapted
easily to other contexts. Chapter V concluded with several
recommendations for further study and development.

The two quotations at the head of this chapter supply
what the author hopes is an accurate overview of the
accomplishment of this dissertation: to help supply our
profession with tools it needs. It is time to be both
ambitious in our aims and modest in our claims. Seymour
Sarason (1971) accurately identified one of the more
dissipating realities on the professional scene when he
wrote: "There are those among the 'change agents' whose ways
of thinking are uncluttered by the possibility that others
see the world differently than they do" (p. 8).

In suggesting ways for a teacher to inquire into a
particular theory and that it is appropriate and necessary
for the profession to provide such opportunities, the author
accepts and welcomes the possibility that many theoretical

positions will come under conscious scrutiny by teachers.
The tasks of school and societal development require the
ready availability of the most potent conceptual tools.
Certainly, the interactional theory has much to contribute,
just as there is much that is yet obscure.

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