DOCUMENT RESUME

ED 244 484 EC 162 786

AUTHOR	Hall, Jane Nelson
TITLE	Evaluation and Comparison: Social Learning Curriculum and Instrumental Enrichment. Final Report.
INSTITUTION	George Peabody Coll. for Teachers, Nashville, Tenn.
SPONS AGENCY	Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE	Dec 81
GRANT	G008001869
NOTE	217p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC09 Plus Postage.
DESCRIPTORS	*Critical Thinking; Enrichment; *Mild Disabilities; Social Development; *Student Attitudes
IDENTIFIERS	*Instrumental Enrichment; *Social Learning Curriculum

ABSTRACT

Two methodologies, quantitative and qualitative, were used in this study designed to evaluate the Social Learning Curriculum and compare its effects with Instrumental Enrichment. The quantitative portion included examination of pretest-posttest performance of 143 mildly handicapped children on six measures and a social knowledge assessment developed by researchers. A quasi-experimental design was employed for the quantitative section in which data were analyzed with the analysis of covariance. Significant differences favoring experimental children were found on the Matching Familiar Figures Test and the General Information Subtest of the Peabody Individual Achievement Test. Qualitative data were collected with modified participant observation and interview techniques. Strong support was found for the research expectation that children taught with the Social Learning Curriculum would develop the ability to think critically; qualified support was found for the other three research expectations regarding the development of the ability to act independently, to comprehend the extrinsic value of schooling, and to develop more positive attitudes toward school. (Author/CL)

EVALUATION AND COMPARISON: SOCIAL LEARNING CURRICULUM AND INSTRUMENTAL ENRICHMENT

Jane Nelson Hall

Final Report of Grant No. G008001869 funded by the U.S. Department of Education under CFDA 13.443A

EVALUATION AND COMPARISON: SOCIAL LEARNING CURRICULUM AND INSTRUMENTAL ENRICHMENT

by

Jane Nelson Hall, Ed.D.
George Peabody College for Teachers
of Vanderbilt University

December 1981

Major Field: Special Education Number of Words 227

The purpose of this study was to evaluate the Social Learning Curriculum and compare its effects with Instrumental Enrichment. Two methodologies were used in the study. The quantitative portion included examination of pretest-posttest performance of 143 mildly handicapped children on six measures: Raven's Standard Progressive Matrices, Test of Social Inference, Matching Familiar Figures Test, General Information Subtest of the Peabody Individual Achievement Test, Piers-Harris Children's Self Concept Scale, and a social knowledge assessment developed by researchers. A quasi-experimental design was employed for the quantitative section; data were analyzed with the analysis of covariance. Significant differences favoring experimental children were found on the Matching Familiar Figures Test and the General Information Subtest of the Peabody Individual Achievement Test. Qualitative data were collected with modified participant observation and interview techniques. Strong support was found for the research expectation that children taught with the Social Learning Curriculum would develop the ability to think critically; qualified support was found for the other three research expectations regarding the development of the ability to act independently, to comprehend the extrinsic value of schooling, and to develop more positive attitudes toward school. The study includes a discussion of the impact of

threats to validity upon the interpretation of field research studies and presents an analysis of the strengths and weaknesses of the study in terms of implications for future research.

Joseph Cunningham, Major Professor Date

ACKNOWLEDGEMENTS

The completion of this final report represents, in a very real sense, the culmination of a personal dream. Dreams dwell on the fringes of reality and can become nightmares very quickly. Certainly this endeavor, from its conception, had the potential for horror. Many people did many things to keep this project going well.

Without the children, this could never have been. I have used "children" generically throughout the report. The children who disturbed my equilibrium and launched me on this search are now young adults. They taught me, in a way the greatest of scholars never could, something of what it means to be called retarded, learning disabled, behavior disordered, handicapped, exceptional, special, stupid, dumb, bad, crazy, or weird. The children who maintained my stamina throughout this study were the 163 with whom it was my very genuine pleasure and privilege to work this year. The first group endured my attempts to teach; the second, my successive approximations of assessment. In both cases, they taught me much and brought me joy.

As important as the children were the teachers. Betty, Jacqueline, Kat, Linda, Lisa, Tate, Barb, Edith, Susie, Becky, Beth Ann, Deborah, Karen, Melvin, and Rick gave me much more than their time and their children. They encouraged, facilitated, consoled, and adjusted their schedules time after time. I am in their debt.

Judy Green brought to this project a conscientious attitude and an inherent respect for the children and the teachers. She did much more than simply help me.

Many others helped in a variety of ways. Thomas Vandever and Judy Stubbs in the Department of Research and Evaluation, and Sheffield Nasser in the Department of Special Education offered invaluable assistance and abiding support. The principals and secretaries of the participating schools were always helpful; I extend appreciation to each.

Carl Haywood and Sid Levy served on my doctoral committee. Reuven Feuerstein gave his time and energy to the theoretical portion of the paper. Otto Bassler answered with competence and compassion, question after question.

Helen Thomas "managed the money" throughout in theory and practice. Mary Ashe helped me make the magic machine run. Karen Kramer and Charity Waddell typed for me throughout the study. Linda Maggart typed the final report and assumed responsibilities for closure. I thank each for her help.

Special thanks must be extended to a few people. Monte Smith overcame considerable resistance to persuade me that statistics were only "little numbers" and the computer, merely a tool. Researchers endow the little numbers with meaning just as they tell the magic machine what to do. Monte also engraved threats to validity upon the very fiber of my being. I take full responsibility for the deficits of the quantitative section of the report. Credit for the strengths should go to Monte because I did what he taught me to do.

Marjorie and Herbert Goldstein made significant contributions to this project. They offered unlimited and unqualified support and scientific freedom. Their calls and letters rekindled a sometimes weary spirit and renewed both perspective and purpose.

Joseph Cunningham has been Major Professor/Principal Investigator. These terms are inadequate. Joe has been, and hopefully will continue to be teacher, mediator, colleague, friend. It is no exaggeration to

say that I shall never do anything as a special educator which does not in some way reflect what Joseph taught me.

Most of all, I must thank Heather. She managed not only to survive but rather remarkably to flourish under the direction of a primary caregiver who was far too often engaged in the written or verbal production of "Peabody talk."

This report is dedicated to the memory of Sheffield Nasser whose caring made a difference for many people.

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CHAPTER I

THEORY

Introduction

> Every educational method depends upon a theory, formulated or implicit, which is at once its point of departure and justification. One would run the risk of falling into blind empiricism if one were to apply an educational method independently of the theory which is its soul. (Binet & Simon, 1914, p. 11)

The purpose of this study is to evaluate and compare two educational intervention programs. A basic assumption underlying the formulation of research questions is that no single educational program and/or methodology can meet the needs of all handicapped children. Emphasis is placed, therefore, on the determination of factors which influence the success or lack of success of the two programs. Examples are characteristics of learners, of teachers, and of instructional environments.

The purpose of evaluation research is to compare a program's accomplishments against its goals (Weiss, 1972). The identification of goals is directly related to the theoretical structure upon which the program was developed. This chapter presents a discussion of the theoretical positions underlying the Social Learning Curriculum (SLC) (Goldstein, 1974a, 1975a) and Instrumental Enrichment (IE) (Feuerstein, 1979).

Argyris and Schon (1974) define theory as a "set of interconnected propositions that have the same referent" (p. 4) and point out that

"theories are vehicles for explanation, prediction, or control" (p. 5). If a theory is considered to be a guide for thought rather than the culmination of thought, the theory is properly evaluated as useful or not useful rather than true or untrue (Argyris & Schon, 1974; Berrien, 1968).

The theoretical positions guiding the SLC and IE will be addressed individually and then compared. The discussion of each theory and the comparison will be organized around three issues: (a) the perspective adopted toward the phenomenon of mental retardation, (b) the nature of the theory, and (c) the relationship of theory to intervention.

Perspective

> The perspective taken toward any phenomenon determines how the phenomenon is defined, the kinds of research operations which will be considered significant, and the kind of action which will be taken. Thus, the perspective taken determines in a primary manner, the meaning of the phenomenon. (Mercer, 1970, p. 379)

Historically mental retardation has been regarded from medical, psychological, and educational perspectives (Goldstein, 1957). An additional approach which has gained importance in recent years is the sociological or "social systems" model (Mercer, 1970). The sociological orientation is discussed at length since it is critical to the theoretical foundation of the Social Learning Curriculum (Goldstein, 1974, 1975a, in press).

Nature of the Theory

Theories may be formally articulated or implicit. Mills (1959) has addressed the difficulties for the social sciences of maintaining an effective balance between the preoccupation with the development of

the "grand theory" and focus upon "abstracted empiricism." If the criterion for the evaluation of theory is its usefulness in guiding thought, neither type of theory can be regarded as inherently superior to the other.

Relationship of Theory of Program

The relationship of the theory to the intervention is correlated to the nature of the theory. Articulated theory is typically formulated prior to the creation of the intervention. The intervention program implements the theory. With implicit theory, the intervention may be a part of the development of the theory.

Perspectives on Mental Retardation

Medical Perspective

Medical interest in mental retardation began in earnest with the work of Itard in 1799 and continued with that of Seguin, Guggenbuhl, Howe, and others in the 1800s. The primary objective of the proponents of the medical perspective was to cure and/or prevent the condition (Goldstein, Note 1). The fact that each of the persons associated with the medical perspective is considered a "pioneer of special education" (Kirk & Lord, 1974) is important to an accurate understanding of current attitudes toward retardation. Mercer (1970, 1973) laments the entrenchment of the "medical model" and Wolfensberger (1969) decries the implications for intervention arising from referring to institutions for the retarded as hospitals rather than schools. Neither of these approaches is surprising since physicians originated and controlled educational intervention with mentally retarded persons

for more than a century (Goldstein, 1957). It is critical to realize that the procedures employed by these physicians have more pedagogical than medical credibility. Itard considered himself a failure because he did not cure Victor's condition; this concern with the inability to relieve and prevent retardation continued long after Itard's work. Indeed, this attitude is characteristic of the period 1890-1925 which Wolfensberger (1969) calls "the indictment"; it was during this period that the term "hospital" replaced school.

Psychological Perspective

"The psychologist is, by definition, a student of the individual rather than the group" (Maslow, 1937, p. 409). Persons who have adopted a psychological perspective on mental retardation have been more concerned with understanding the condition than with trying to cure it. Interest has been focussed upon qualitative and quantitative variations in the nature of retardation within and among individuals. This direction led to intense research in measuring the variations. Historically, the primary manifestation of the psychological perspective was the development of "mental tests" beginning as early as 1869 with Galton's Hereditary Genius (Maloney & Ward, 1979). The movement gained credibility and popular acceptance with the publication of the Binet-Simon Scale of Intelligence in 1905 and its subsequent standardization in America by Terman in 1916 (Maloney & Ward, 1979). From a psychological perspective, mental retardation is characterized by deficiencies in basic mental operations such as perceiving, classifying, associating, and abstracting.

Educational Perspective

Educational concern with mental retardation as manifest in the public schools' assuming primary responsibility for intervention was sporadic until the beginning of the 20th century (Goldstein, 1957). Montessori's efforts at the close of the 1800s mark the beginning of a true educational perspective. In discussing her work she states: "I, however, differed from my colleagues in that I felt mental deficiency presented chiefly a pedagogical rather than mainly a medical problem" (1912, p. 31). The primary objective of those espousing an educational perspective was ameliorative, i.e., effort was directed not toward curing the retarded individual nor toward studying variations in the nature of the retardation but toward "trying to incorporate the retarded individual into society through making the individual has own best advocate in terms of competence" (Goldstein, Note 1).

Sociological Perspective

The development of a sociological perspective toward the phenomenon of mental retardation has been much more recent. Indeed, wide acknowledgement of the viewpoint in the United States may be dated as late as 1970 with Mercer's (1970, 1973) presentation of the social systems model. In 1941, Doll laid the foundation for the sociological perspective by emphasizing that a defining characteristic of persons who are classified mentally retarded is social incompetence. McCullouch (1947) expanded upon Doll's work to formulate the first American sociological interpretation of retardation. McCullouch's position differs from Doll's in two critical ways. First, he specifies that social incompetence "may be viewed as a function of numerous traits" (1947, p. 133) which he classified in three groups:

intellectual abilities, "acquired skills or habit families" and "temperament-personality characteristics" (1947, p. 134). In addition, he emphasizes that "social competence is a modifiable condition" (p. 134) which must be judged according to the standards of the social system in which the individual is expected to function.

> Individuals in the community are constantly being rated by their peers in respect to various areas of social activity. Although competence is commonly recognized as varying on a continuum, there may be considered to be a point on this continuum below which incompetence is so gross as to be intolerable. Stated differently, communities may be said to have tolerance lines or thresholds below which lies gross social incompetence. As has been repeatedly emphasized in the literature, numerous social and economic factors cause this tolerance line to fluctuate at different loci and times. (1947, p. 134)

From a sociological perspective of retardation, McCullouch's (1947) "reformulation" served to operationalize rather than refute Doll's theory.

> According to Doll's definition, the child who is diagnosed as mentally deficient is irremediable and uneducable. The difficulty of determining whether this mental deficiency is likely to obtain at maturity makes the diagnosis of mental deficiency at an earlier age a little precarious. Writers in the field of mental deficiency have tended to presume that if a child so diagnosed is ultimately trained or educated to become socially competent and is able to manage his affairs in life, then the earlier diagnosis was wrong. (Kirk & Johnson, 1951, p. 8)

McCullouch's work also cleared the way for Kanner's (1949) differentiation of absolute and relative retardation. Kanner described persons with absolute retardation as "individuals so markedly deficient in their cognitive, emotional, and constructively connative potentialities that they would stand out as defectives in any culture" (1957, p. 70). Relative retardation, on the other hand, refers to "individuals whose limitations are definitely related to the standards of

the particular culture which surrounds them. In less complex, less intellectually centered societies they would have no trouble in attaining and retaining equality of realizable ambitions" (1957, p. 71).

In 1956, Dexter began a series of publications in which he openly called for a sociology of mental retardation. Like McCullouch, Dexter was influenced by the work of Doll and, interestingly, maintained an active correspondence with Doll throughout the formulation of the perspective. Dexter (1956) argued that mental retardation should be regarded as a social problem.

> A "social problem" exists when there is deviant; irregular disapproved, or undesired behavior; this behavior either may be described entirely in terms of a conflict or conflicts in roles, statuses, or values, or at least is accentuated by such a conflict or conflicts. Once the conflict is perceived as such, the nature of the problem may be understood. (p. 11)

Dexter's work is particularly important because he directly addressed factors which led to the need for an explicit statement of a sociological approach to mental retardation. One of the forces is democracy.

> In the old predemocratic days, women, paupers, and the "lower classes" generally were not expected to manifest talent, so the "mentally defective" were not singled out as subpar. But now, almost everybody else . . . is supposed to have rights, duties, and corresponding talents.
>
> At the same time, the strong humanitarian strain in 19th and 20th century society has made us labor earnestly to make everybody else like us or like our ideal picture of ourselves; and the . . . idealization of one set of cultural values . . . has also led us to struggle to make "educated" men and women out of mental defectives and where the effort did not succeed to stick them away out of sight. (1956, p. 15)

The other force is capitalism. Dexter (1958) emphasizes that the educational institution serves a number of functions. Primary functons are to equip persons to deal with a complex culture which is

underlain by interdependence upon common symbols, to socialize persons in the meanings valued by the culture, and to bestow social status on the basis of performance. The priorization of these functions varies according to the particular culture. Dexter (1958) thinks that the American culture values the ability to learn symbols and their meanings not only as a means to the end of appropriate behavior but also as an end in itself.

> In our society, mental defect is even more likely to create a serious problem than it is in most societies because we make demonstration of formal skill at coordinating meaning (reading, writing, and arithmetic) a requirement for initiation into adult/social status, although such formal skills are not necessarily related to the capacity for effective survival or economic contribution. (p. 920)
>
> There is a distinct possibility that many mental defectives become concrete social, legal, or economic problems simply because of the direct or indirect consequences of <u>this</u> requirement for initiation into social status and for no other reason. The indirect consequences of the high valuation placed upon such skill manifest themselves in discrimination and prejudices against the "stupid" which leads them to acquire a negative or hostile self image of themselves. (p. 920)

Further,

> In a society like ours which emphasizes as an end in itself formal demonstration of skill in the technique of symbolization and coordinating of meanings a far higher proportion of mental defectives are likely to be treated as cases of a social problem that would be so treated in a society emphasizing some other set of values, for instance the capacity for survival or effective economic contribution. (p. 922)

People who do not or cannot conform to these expectations are distinguished within the school setting and have a higher probability of becoming marginal members of the larger social system as adults.

Dexter (1956, 1958) does not address specifically intervention programs. He does suggest,

> It is probable that a considerable proportion of the social burden and economic cost of mental defect arises, not out of

> lack of intellectual ability as such but out of accommodation that mental defectives learn to make of the consequences of such lack. (1958, p. 925)

One intervention approach, then, would focus on helping mentally retarded persons to learn "different methods of accommodation" (1958, p. 925).

Farber (1968) extends Dexter's work by relating the concept of organizationally surplus populations to the American valuation of an individual's ability to master the symbolic system and the meanings for which it stands. From Farber's perspective, democracy and capitalism combine to focus upon maintaining a population necessary to operate a social system rather than establishing a system into which each member of population can fit. Concern with optimal operation of a capitalistic economy requires a pool of surplus persons. Democratic philosophy prohibits the assignment of a person to positions on the basis of inherent traits or characteristics; rather, each person must have "equal opportunity" to achieve any position.

There must be, therefore, objective criteria upon which to evaluate the individual's ability to meet the demands of the task. In a social system which is democratic and capitalistic, these criteria are equivalent to "the social and academic competencies in the educational institution" (Farber, 1968, p. 254). These competencies are skill in learning and using appropriately symbols and their meanings (Dexter, 1958).

Farber refines Dexter's notion of helping retarded people learn "different methods of accommodation" (Dexter, 1958, p. 925) by constructing a conceptual framework into which patterns of accommodation

can be fit. Structural aspects of the framework are public and private cultures. The public culture is defined as "norms and skills associated with efficiency of communication, rational organization of personnel and machines, planning of future operations, and maintenance of the individual's position within the system" (Farber, 1968, p. 196). Because American culture is so complex, the norms and skills which characterize the public culture focus upon the coordination of symbols and interpretation of meanings (Dexter, 1956).

Private cultures, in comparison, "are small, fragmented, somewhat autonomous groupings that have bases for existence outside the public culture" (Farber, 1968, p. 106). Examples of "bases for existence" are religious and ethnic status. The norms and values of private cultures do not necessarily run counter to those of the public culture. To the extent that they do, however, and to the extent that the educational system emphasizes the norms and values of the public culture, the probability that an individual socialized in a private culture will succeed in the educational system is reduced. This is particularly true using Dexter's conceptualization of the "properly educated person" as one who responds to perceptions "not only in terms of physical reality but in terms of social expectations and propriety" (Dexter, 1958, pp. 921-922).

Farber (1968) integrates public and private cultures and school success through the concept of life chances, a sociological term which refers to "the probability of any individual (sic) attaining a successful social and economic position in the society" (p. 14).

> Educational, political, and economic institutions constitute a core of integrating mechanisms in modern society and the coordination of activities in this core is made possible by the

existence of a "public culture." Successful participation in these social institutions requires that individuals be socialized in the language, values, norms, and perspectives of the "public culture." Unless this kind of socialization occurs, the life chances of individuals are very limited. . . . The mentally retarded are grossly undersocialized in characteristics reflecting the public culture.

If life chance depends upon the extent of socialization in aspects of the public culture, the education of the mildly retarded should be aimed in this direction. The few studies of graduates of special education programs that have been cited (Carriker, 1957; Cohen, 1960; Dobroff, 1967; Kennedy, 1948; Kolstoe, 1961; Krishef & Hall, 1955; Shafter, 1955; Porter & Milazzo, 1958) suggest that the rules of the public culture can be incorporated into a curriculum for the educable retarded. These curricula generally make explicit those rules and assumptions which most people learn more informally. One of the latent consequences of special education may be to facilitate learning how to "pass" as nonretarded in adulthood. Although these special programs cannot solve the fundamental problems of reducing organizationally surplus populations, they seem to increase the life chances of some retarded individuals. (Farber, 1968, pp. 254-255)

Mercer's (1970, 1973) social systems approach represents an integration and expansion of the work of McCullouch, Dexter, and Farber. She approaches the phenomenon of retardation from "the sociological tradition and the study of deviant behavior" (Mercer, 1973, p. 21) and grounds the theory in the framework of a social system.

A social system consists of a set of statuses or positions which are bound together by mutual privileges, obligations, and expectations as to how a person occupying a particular status ought to play his role. These shared expectations are the norms of the system. (Mercer, 1970, p. 382)

A mentally retarded person is "one who occupies the status of mental retardate and plays the role of mental retardate in one or more of the social systems in which he participates" (Mercer, 1973, p. 27). In a sense, the social systems perspective demands a subjective determination of retardation.

If a person does not occupy the status of mental retardate, is not playing the role of mental retardate in any social

system and is not regarded as mentally retarded by any of the significant others in his social world, then he is not mentally retarded, irrespective of the level of his IQ, the adequacy of his adaptive behavior, or the extent of his organic impairment. (Mercer, 1973, pp. 28-29)

It is quite possible for a person to occupy the MR status in only one social system, i.e, a person may occupy the MR status in the school but not in the family or neighborhood (Mercer, 1970, 1973). Using Farber's conceptual framework, this is particularly likely if the social system of the school reflects the values of the public culture while that of the family and neighborhood reflects norms of private cultures.

Social Learning Curriculum: The Theory

Perspectives on Mental Retardation

Development of Sociological Perspective

Accurate understanding of the development of the sociological perspective of retardation is important to the analysis of the theoretical foundations of Goldstein's work. Dexter (1958) suggests that each of the historical perspectives contained implicit sociological elements.

Many factors converged to create a need for an explicit statement of a sociological perspective toward mental retardation. Specific examples are improvements in medical science which allowed more people to live longer, provision of mandatory education creating the possibility of social mobility, and changes in demographic and occupational interests from rural to urban and agrarian to industrial.

The sociological perspective was also dramatically influenced by the response of the federal government to the economic depression of

the 1930s and World War II. The adoption of social welfare policies in the 1930s in conjunction with the productive employment of many mildly retarded persons during the war effort (Farber, 1968) raised questions regarding the adequacy of historically established approaches to mental retardation. The objective of the sociological perspective is to understand the phenomenon in terms of a social system or order. The focus is upon identifying forces which combine to increase the probability that a given person or class of persons will be designated mentally retarded. These forces are more likely to be institutional, such as economic conditions, than individualistic like organicity. Sociological intervention ranges from the attempt to alter the individual to conform to societal expectations to implementation of reform which would alter the entire social system.

Goldstein's focus of interest throughout his career has been the social development of mentally retarded people. The Social Learning Curriculum represents an integrated culmination of 25 years of research in this area. This time period (1950-1975) parallels the era of rapid formation of a sociological perspective of mental retardation in the United States.

Development of Socioeducational Perspective

From the framework of historically established approaches, medical, psychological, and educational, Goldstein's theoretical position is educational. He has declared himself to be "a purist in the education of the mentally retarded" (1975b, p. 279) and has centered the bulk of his research within the educational institution.

By virtue of his objectives, the educational perspective is influenced by other orientations toward retardation. If the medical perspective is accepted, retardatin is regarded as an illness and the amelioration is seen as a treatment, i.e., "teaching" people to be well. Emphasis on the psychological perspective leads to ameliorative efforts directed at basic psychological processes such as perceiving, discriminating, associating, remembering, thinking, etc. If the sociological orientation is used, educational efforts focus on attempting to reduce the probability that persons who have been assigned to the MR status as students will maintain this status as adults.

The perspective which had directed Goldstein's work is socio-educational, i.e., an educational orientation heavily influenced by a sociological perception of retardation. As early as 1957, he began writing of mental retardation as a status in society which is determined by "the interplay of social function, role, and intelligence" (1957, p. 1). He assumes that every society has needs; the cultural responses to these needs are "social functions" which range from the satisfaction of physiological needs to the provision of mental and psychological satisfaction. "The behavior of the individual with respect to the cultural responses determines his social status" (Goldstein, 1957, p. 3).

> It is only when the individual fails to fulfill role expectations in the absence of obvious obstacles that he/she becomes eligible for the MR status. Mental deficiency becomes a special status within the group . . . when the concepts of intelligence and role are drawn into a relationship. When the intellectual ability of persons are (sic) "in phase" with the requisites or the statuses and roles with which they are associated, there is no problem which can be attributed to the lack of intellectual ability. If, on the other hand, persons are unable to fulfill the group's

> expectations, and this inability is due to the intellectual inability of the person to act out the roles within the norms established by the society, the group becomes faced with a problem of social incompetence. Out of this condition develops the special status of the mentally deficient with their own rights and duties. (Goldstein, 1957, pp. 5-6)

Clearly, the complexity of role expectations is a result of the nature of social needs and the intricacies of the responses generated to meet those needs. In every simple cultures, only persons who are quite severely handicapped--those who "no savvy nothing" (Goldstein, 1957, p. 9) are assigned to the MR status. As the complexity of the social system increases, there is a concomitant increase in the intricacy of behavioral expectations. The more complicated behavioral expectations become, the higher is the probability that some persons will be unable to fulfill role expectations and will be assigned to the MR status. The majority of persons who occupy this status will fit Kanner's (1948) category of relative rather than absolute retardation.

Goldstein's (1976) position is very similar to that of Mercer (1973) and of Brooks and Baumeister (1976).

> Mental retardation is, first and foremost, a social phenomenon. While there are many behavioral theories which have been formulated about retardation--psychometric, sociological, cognitive, learning, and motivational--the most basic conception of all could be considered a social-cultural one. This is the naive view of deviance held by the family, friends, or teachers of an "afflicted" person, i.e., the recognition that a particular individual is not behaving according to the community's rules of normality. (pp. 407-408)

The critical factor which differentiates Goldstein's work from that of other proponents of a sociological perspective, i.e., McCullouch, Dexter, Farber, Mercer, or a social psychological perspective, Brooks and Baumeister, is his concern with intervention. Interestingly, both the rationale and direction for intervention were proposed by Maslow in 1937.

> The most amazing single fact confronting the psychologist when he deals with cultures comparatively is that so many different ranges and kinds of behavior are not only possible but actually extant. New individuals born into any cultural group in most cases fit into the cultural demands easily, i.e., conform easily to any standards or social norms already present in the group. Such a fact argues a malleability in a certain direction that the psychologist has not exploited sufficiently. It would seem that a good deal of what is important in human nature is very far from being a fixed thing determined by genes and chromosomes in an invariable way. . . . Norms of behavior are a function of the particular culture under consideration . . . different cultures have different norms. Thus, abnormality must be considered as relative to the culture and, as a consequence, cannot be altogether understood except when the culture is understood, in its fundamental emphasis, its norms of behavior, its ideals and its judgements passed on different kinds of behavior. (Maslow, 1937, pp. 415-416)

Maslow provides the rationale for Goldstein's work by emphasizing the "malleability" of human behavior. The cross-cultural variability of behavioral patterns is significant for two reasons: It rebuts the notion that all human development is an immutable process determined by biogenetic factors and supports the hypothesis that individuals learn to conform to specific cultural expectations.

He provides the direction for intervention by stressing that normality has meaning only as a relative concept. Not only is the range of human behavior very extensive, but the standards by which it is evaluated vary from one culture to another. The designation of abnormality, therefore, is a direct function of the extent to which an individual's behavior deviates from cultural expectations.

Nature of the Theory

The theoretical base underlying the SLC is implicit. The adoption of an implicit theory can be attributed to several factors. First, Goldstein began his research prior to the articulation of a sociological perspective. Indeed, if Dexter's (1956, 1958) work is accepted

as the beginning of attempts to formulate a sociological orientation, the period of research leading to the SLC and that of the development of the sociological perspective correspond almost exactly (see Table 1). Second, Goldstein's research has been almost exclusively of an applied nature. Although educational "field research" has increased in frequency of application and refinement of technique (Cook & Campbell, 1979), Goldstein's early efforts (Goldstein, Mischio, & Minskoff, 1969; Goldstein, Moss, & Jordan, 1965) represented radical departures from traditional "biologically based methods of research" (Goldstein, 1975b, p. 292). To the extent that Goldstein's efforts influenced Farber (1968) in expanding and refining the sociological perspective his research supports the notion "that scientists can design their investigations in such a way that both theoretical and applied concerns can be served simultaneously" (Haywood, 1969, p. 379).

Relationship of Theory to Intervention

Just as the development of the theoretical foundation of the SLC has paralleled the formulation of the sociological perspective toward retardation, the theoretical structure of the SLC and the actual intervention program have grown reciprocally. The intricate relationship between the theory and the curriculum makes it extremely difficult to separate one from the other.

In a very real sense, the initial conceptualization of both theory and intervention occurred during Goldstein's experience as public school special education teacher. His "preoccupation with the substantive nature of teaching programs and methods of instruction" (Goldstein,

TABLE 1

RELATIONSHIP BETWEEN SOCIAL SYSTEMS PERSPECTIVE ON RETARDATION AND GOLDSTEIN'S WORK

1941 - Doll--a defining characteristic of mental retardation is social incompetence

1947 - McCullouch--a) social incompetence is a function of intellectual abilities, learned skills, personality motivation traits; b) social incompetence is modifiable

1949 - Kanner--differentiates absolute and relative retardation

1956 - Dexter--call for a sociology of mental retardation

1966 - Mercer--begins serious writing of social systems approach

1968 - Farber--Mental Retardation: Its Social Context and Social Consequences

1970 - Mercer--formal presentation of social systems approach

1973 - Mercer--Labeling the Mentally Retarded

1949 - B.A. degree in Special Education classroom teacher

1952 - M.A. in Special Education; thesis--An Experiment with the Vineland Social Maturity Scale to Establish its Predictability in the Vocational Placement of Mentally Retarded Adults

1957 - Ed.D. in Special Education; dissertation--Social Aspects of Mental Deficiency

1958 - Illinois Guide for Teachers of Educable Retarded Children (with D. Siegle)

1965 - Efficacy of Special Class Training on the Development of Mentally Retarded Children (with J. Moss & L. Jordan)

1969 - A Demonstration and Research Project in Curriculum and Methods of Instruction for Elementary Level Mentally Retarded Children (with G. Mischio & E. Minskoff)

1974 - Social Learning Curriculum (Phases 1-10)

1975 - Social Learning Curriculum (Phases 11-16)

1975b, p. 288) began in the classroom as did his interest in the post-school adjustment of children who were in special classes. His examination of "follow-up studies" in conjunction with observation of the children in his class and nonhandicapped children in the school led him to the hypotheses which have characterized subsequent work. The first is that the critical area of intervention for mentally retarded people is social adaptation; the second is the key ability which leads to differential adaptation is generalization. Mentally retarded people do not "generalize from prior and immediate learnings and experience to the novel problem at hand" (Goldstein, 1975b, p. 287).

His doctoral dissertation is an in-depth analysis of the social status and adaptation of mentally retarded persons as reported in the literature of "social-welfare, medico-psychological treatment, education, law, anthropology, and government reports" (Goldstein, 1975, p. 1). His next major work was in the area of curriculum as he collaborated with Siegle to develop the Illinois Guide for Teachers of the Educable Mentally Retarded (Goldstein & Siegle, 1958). These two experiences became integrated in successive research projects: The evaluation of the efficacy of special classes for retarded children in Illinois (Goldstein et al., 1965) and a naturalistic replication of the Illinois study in New Jersey (Goldstein et al., 1969).

The central focus of the Illinois Curriculum Guide was "persisting life functions" (Goldstein & Siegle, 1958). These life functions were identified on the basis of "areas of competence common to 'socially adapted' people in our society" (Goldstein, Note 2) and included vocational adjustment, appropriate and satisfying use of leisure time.

Careful examination of the use of the Illinois Curriculum Guide in the New Jersey study revealed the need for a more detailed organization of content and a more specific connection between objectives and content. As a "guide," the Illinois Curriculum provided a list of objectives and suggested content for achieving those objectives. The global nature of the suggested content promoted discontinuity of experience for children; indeed the New Jersey study indicated that although the teacher thought they were teaching what the guide called for, less than one-third were presenting instruction which was congruent with the objectives of the program (Goldstein, Note 2). This finding had significant implications for the development of the SLC.

For the purposes of this discussion, several arbitrary and yet heuristic divisions will be made. The first is between the development of the theory and the development of the intervention. Within these discussions, further subdivisions will be presented. In the theoretical section, factors influencing the sociological assumption will be presented separately from forces affecting the educational assumptions. A similar division will be made in the curriculum section between content and process or methodology.

Sociological Assumption

Theoretical bases. From a sociological perspective, a person who is designated mentally retarded is occupying a deviant status within a social system. Deviance is relative and can be understood only within the context of the culture (Farber, 1968; Goldstein, 1957; Maslow, 1937; Mercer, 1965, 1970, 1973). If the ultimate objective is ameliorative, i.e., to intervene in such a way that probability of an

individual's being designated mentally retarded is reduced, focus must be upon identifying behaviors which differentiate deviant from nondeviant.

Dexter (1956, 1958) has stressed that this society values "formal skill at coordinating meanings (reading, writing, and arithmetic)" (1958, p. 920) and has also suggested that

> It is probable that a considerable proportion of the social burden and economic cost of mental defect arises, not out of lack of intellectual ability as such but out of accommodation that mental defectives learn to make to the consequences of such lack. (1958, p. 925)

"Skill at coordinating meanings" (Dexter, 1958, p. 920) is very similar to what Thorndike (1920) calls "abstract intelligence." He defines this as "the ability to understand and manage ideas and symbols, such as words, numbers, chemical or physical formulae, legal decisions, scientific laws and principles, and the like" (1920, p. 222). Abstract intelligence is one component of a tripartite model; the other two elements are social and mechanical intelligence.

Interestingly, Thorndike's model has been resurrected recently in attempts to deal with intelligence in general and mental retardation in particular. Guilford (1967) attributes the content dimensions of the Structure of the Intellect Model to Thorndike's tripartite conceptualization. He alters Thorndike's model only to break abstract intelligence into semantic and symbolic content. Greenspan (1979, 1980) focuses on the social intelligence aspect to propose a new definition of mental retardation based on "deficits in adaptive intelligence (conceptual, practical, and social intelligence) that may or may not be accompanied by deficits in socioemotional adaptation" (Greenspan, 1979, p. 518). Wechsler (1974) has used the tripartite model to defend the IQ test. His pervasive argument has been that the standardized

intelligence test was created to measure abstract intelligence and cannot be faulted for its inability to assess social and mechanical intelligence.

Clearly, abstract intelligence is a factor in the designation of a person as retarded. Deficits in the ability to understand symbols and ideas are not the sole determinant of mental retardation, however, as is evidenced by the addition of the adaptive behavior criterion to the formal American Association on Mental Deficiency (AAMD) definition in 1961 (Heber, 1961). Adaptive behavior as defined by the AAMD can be fit rather nicely into Thorndike's other two categories: social intelligence and mechanical intelligence (Greenspan, 1979).

Statement of the assumption. The task of identifying differentiating behaviors to guide intervention demands a drastic reduction of these conceptual areas of ability. The sociological assumption of the theory of the SLC represents such a reduction.

> Reduced to essentials, the two pervasive characteristics requisite to social competency in a society such as ours are the abilities to think critically and to act independently. We present to the maturing individual no clear-cut or lower limits for these characteristics. Irrespective of his physical and/or mental status, it is incumbent upon the individual to "read" his environment, to recognize the criteria for social adjustment, and then to perform in such a way that he does not attract to himself the disapprobation, codified or not, awaiting those who in some way threaten the equilibrium. To put it another way, we leave it to him to weigh the facts and their possibilities (think critically) and then decide how to act on those facts (act independently). If the individual's perceptions of the facts are usually accurate and if his actions and strategies are in harmony with the world around him, he is probably well assimilated into society. (Goldstein, Note 3, p. 1).

If deviance is relative to cultural expectations, the essence of the sociological assumption is that nondeviant or "normal" behavior is composed of two skills: the ability to think critically, "to

process information within the framework of a problem-solving strategy in a consistent, appropriate, effective, and efficient manner" (Warshow & Bepko, Note 4, p. 2), and to act independently or "to apply this strategy without undue reliance on others" (Warshow & Bepko, Note 4, p. 2). The concept of critical thinking implies the mastery of content in the form of facts and concepts (Goldstein, Note 3). The nature of our society, as Dexter (1956, 1958) has pointed out, demands that much of this content take symbolic form (Thorndike's abstract intelligence). However, the content of critical thought is not exclusively abstract but focuses also on people (social intelligence) and things (mechanical intelligence).

The independent action component of "normal" behavior is a personality-motivation variable (Goldstein, Note 5). This factor addresses the second element of Thorndike's definition of each of the three intelligences: abstract, social, and mechanical, i.e., the ability "to use" what is understood.

The behavior of people who attract negative attention to themselves may be classified according to deficits in either/or both of these components. The behavior of some persons seems to indicate that they lack content; their store of facts and concepts is inadequate for meeting the demands of daily living in a complex society (Goldstein, Note 3). Other people seem incapable of acting independently even though they exhibit evidence of the ability to think critically. These people are described as lacking a "self-starter" (Goldstein, Note 3, Note 5). The behavior of other people indicates a tendency to act independently without extensive application of critical thought (Goldstein, Note 3, Note 5).

It is critical to realize that these patterns of behavior are not peculiar to retarded people. Indeed, Gold's (1973) competency-deviancy hypothesis is based upon the fact that many people of all levels of intellectual ability exhibit behavior which fits these patterns. Society will tolerate deviant behavior from a person who exhibits exceptional competence in a specific area (Gold, 1973; Homans, 1961). A person who is not able to provide a rare and needed service is obliged to comply to societal expectations; this obligation is not unique to mentally retarded persons. Indeed, only a few individuals possess such exceptional skills (Homans, 1961).

Educational Assumptions

Content. Content assumptions are drawn from the personality theories of Maslow (1968), Stagner (1937, 1964), and Rotter (1954). Maslow's primary contribution to the theoretical base of the SLC is the proposition that behavior is generated in response to need. More specifically, human behavior does not occur in a random fashion; rather, it is deliberately produced in an attempt to satisfy a need.

Stagner's theory is important for two reasons. First, Stagner applies the principle of homeostasis "which relates to the maintenance and restoration of favorable steady states under a variety of conditions" (1961, p. 70) to human psychological behavior "in an effort to point out underlying similarities in what may seem, superficially, to be quite different happenings" (1961, p. 70).

The second contribution of Stagner's work is the proposition that "perception determines response" (1961, p. 70), i.e., behavior is learned (Stagner, 1937) and the way in which a person has come to perceive or understand a stimulus or set of stimuli influences the

manner in which he/she responds to the stimulus. The relationship between homeostasis and perception is complex and dynamic. Essentially, "When equilibrium is disturbed . . . percpetion functions as an essential tool for the restoration of favorable conditions" (Stagner, 1961, p. 71).

The nature of the individual's experience with the stimulus effects the manner in which he/she comes to perceive it. If the interaction is rewarding, the stimulus is likely to attract the person and is designated by Stagner (1961) to have a positive valence. If the person's experience is punishing, the stimulus has a high probability of being considered threatening. Such a stimulus has a negative valence.

Each time the balance is upset, the principle of homeostasis requires that the individual will attempt to reestablish equilibrium. The outcome of his/her efforts affects both the perception of the stimulus and the valence associated with it. Because human behavior rarely occurs in isolation, the feedback (direct or indirect) that the person gets impacts upon learning. "When we respond to a person, the person responds in turn. That is, there is some feedback as to how he perceives our action. Much important social learning depends on this mechanism" (Stagner, 1961, p. 79).

In a sense, Rotter's (1954) Social Learning Theory (SLT) provides a structure for integrating the proposition of Maslow (1968) and Stagner (1937, 1961). He says, "The unit of investigation for the study of personality is interaction of the individual and his meaningful environment" (Rotter, 1954, p. 85). The "meaningful environment" of the person is composed of the stimuli, the person's perceptions and,

at a more abstract level, "conceptions" (Stagner, 1961) of the stimuli, and the valence associated with the stimuli. Rotter (1954) operationalized Maslow's (1968) proposition that behavior is generated in response to need by equating "need" with "goal" and asserting that human behavior is goal directed. Associated with the notion of "goal-directed" behavior is expectancy. The intensity or persistence of an individual's behavior is a function of the importance of the goal (or need) and the cognitive expectations of reward or punishment.

The content assumptions of the theoretical base of the SLC are as follows:

1. Since behavior is learned, inappropriate adult behaviors are the result of an individual's experiences in childhood and/or adolescence;
2. Inappropriate behaviors, in some way, have been reinforced so that they are well integrated into the total behavioral repertoire of the maturing individual and persists because they are, in the view of the individual, his best or only mechanism for fulfilling a need;
3. Inappropriate behaviors have positive counterparts that can be identified by educators;
4. Given all of the above, positive behaviors thus identified can be ordered developmentally and arranged as the content of learning in the form of activities. Such activities would constitute experiences based on the facts and concepts basic to the "acting out" and reinforcement of the desired behavior and;
5. The efficacious implementation of such experiences early in the school careers of the retarded child will equip the student, and ultimately the adult, with constructive ways of meeting his needs and thereby reducing the probability of the emergence of self-defeating behaviors. (Goldstein, Note 5, pp. 17-18)

Process/methodology. The dual nature of the sociological assumption requires the identification of a methodology which will facilitate the process of acting independently. Beyond the identification of a methodology is the integration of the methodology with the content. An initial step in formulating these assumptions is the identification

of a theoretical perspective which is congruent with the theoretical bases of the content assumptions and which is grounded in empirical data. Since "mentally retarded persons are inefficient learners by definition" (Haywood, Note 6, p. 30) the specification of a learning theory which can be operationalized for inefficient learners becomes a basic concern. For the purposes of the SLC, a cognitive Gestalt theory (Werner, 1957) "stands out as having direct relevance to both the organization of content and the behavior of teachers and learners alike" (Goldstein, Note 5, p. 39).

From a Gestaltist orientation, learning can be conceptualized as a three-stage procedure. In the first stage, or the Mass, the learner is confronted with "an undifferentiated whole" (Goldstein, Note 1). The Mass, as a whole is unfamiliar to the learner, i.e., he/she may recognize and relate parts of the Mass to his/her meaningful environment (Rotter, 1954) but the Mass as an entity represents a new experience. The second stage is called Differentiation. In this stage, the Mass is literally broken down and analyzed. In the final stage, Integration, the pieces are recombined into a meaningful whole which can be integrated into the experience of the learner.

The adoption of a cognitive Gestalt approach to learning is congruent with the theoretical work which supports the content. From Stagner's (1961) perspective, the introduction of a Mass which cannot be fit as an entity into the existing perceptions of the individual upsets the homeostatic balance. This disequilibrium creates a need; from this need, behavior will be generated (Maslow, 1968). The nature of the behavior will be a function of the person's perceptions and conceptions

of the pieces of the Mass (Stagner) and the positive or negative valences associated with those perceptions. In Rotter's (1954) terminology, the individual's behavior will result from his/her attempts to relate the Mass to his/her meaningful environment and the expectations of success or failure associated with those attempts.

A second pedagogical perspective is important. This is the theoretical position of Dewey (1910, 1916) with regard to teaching persons to think or to solve problems in a logical fashion. Stages in reflective experience are important because of the way in which they integrate the content theories (Maslow, Stagner, & Rotter) and the process theories (Werner). This is particularly true in the first stages of the process. These stages are:

1. "Perplexity, confusion, doubt, due to the fact that one is implicated in an incomplete situation whose full character is not yet determined" (Dewey, 1916, p. 150). In terms of the personality theories discussed earlier, the person finds himself/herself in a state of disequilibrium.

2. "A conjectural anticipation--a tentative interpretation of the given elements attributing to them a tendency to effect certain consequences" (Dewey, 1916, p. 150). In terms of the personality theories, the individual formulates a conjecture on the basis of perception (Stagner, 1961) or within the framework of the "meaningful environment" (Rotter, 1954); the conjecture is accompanied by expectations (Rotter, 1954; Stagner, 1961).

3. A careful examination of all possible considerations which identify the problem (Dewey, 1916)

4. A clarifying elaboration of hypotheses (Dewey, 1916)

5. Committing oneself to a hypothesis which requires overt action (Dewey, 1916).

From a pedagogical perspective, reflective thought is developed in the following sequence of steps:

1. The problem is presented to the learner by the teacher.

2. The learner then defines the problem by relating the elements of the problem situation to his/her own meaningful environment.

3. On the basis of the definition, the learner "formulated hypotheses" which are applicable to the situation.

4. The learner, then, with the assistance of the teacher, verifies the hypotheses until a solution is achieved. The hypothesis which results in solution of the problem is incorporated into the repertoire of the individual as a rule (Dewey, 1910; Gagne, 1977).

Intervention: SLC

Structural Features of Content

Need Areas

The educational content assumptions of the theoretical base of the SLC emphasize the sociological orientation. The objective or education, particularly for mildly handicapped learners is to increase the extrinsic value of the school program. Glennon (1975) refers to this approach as "the social utility theory of curriculum" and says that this theory adopts "one reasonable criterion for selecting subjects to be taught: is the topic likely to be used in common business and social situations of adult life?" (Glennon, 1975, p. 121).

Given this orientation, the selection of content is molecular, i.e., "it focuses on what seem to be singular behaviors which, in varying combinations, form more complex operations consistent with social adaptaton" (Goldstein, Note 5, p. 18). Within this molecular framework, a sequence of stages may be postulated. They are:

1. Ascertaining the negative behaviors that appear to correlate with maladaptation,
2. Categorizing behaviors into meaningful clusters,
3. Transposing negative behaviors into their positive counterparts and organizing them developmentally,
4. Stating behavioral objectives and subobjectives for each of the targeted behaviors, and,
5. Writing curriculum content that will underly the attainment of objectives. (Goldstein, Note 5, p. 19)

At this point in the process of theory and curriculum development, data from applied research are important. Two areas of research are particularly important. The first is the postschool adjustment of persons who have been educated in special classes for mentally retarded students. Examples are the work of Baller, Charles, and Miller (1967), Fairbanks (1933), Kennedy (1948, 1966), Porter and Milazzo (1958), Tizard (1956), and Voelker (1962). The second area of specific concern is the in-school social adjustment of mentally retarded children. Relevant research here is the work of Baldwin (1958), Johnson (1950), and Johnson and Kirk (1950).

Results from these studies stimulated the development of a questionnaire which was distributed to persons across the United States who were likely to encounter in their work mentally retarded persons who were experiencing failure (Goldstein, Note 3). The largest category of recipients was composed of vocational rehabilitation counselors. From the responses to the survey, an array of critical behaviors and the contexts in which they occurred was identified. In accordance with

the personality theories previously addressed, the behaviors were organized into need areas. If behavior is conceptualized as the attempt of an individual to meet a need, then it is important to identify and categorize the needs which stimulate behavior.

From the behaviors targeted by the rehabilitation workers, an arbitrary but heuristic structure was developed. Reported behaviors were clustered according to the personal need to which they seemed best related. "It can be added, parenthetically, that this construction needs to be seen as hypothetical and subject to further study and refinement, rather than as a hard and fast theoretical position" (Goldstein, Note 5, p. 21). Need areas are grouped into three categories: physical, social, and psychological; this designation reflects the earlier work of Kirk and Johnson (1951); need areas and definitions are presented in Table 2.

Expanding Environments

The second structural dimension from a molecular orientation to curriculum development relates to "the ordering of behaviors into sequences congruent with maturation" (Goldstein, Note 5, p. 21). Clearly a developmental approach is indicated, but the complexity of the behavioral content dimensions in their combination of cognitive and affective components precludes "an extrapolation of Piagetian theory" (Goldstein, Note 5, p. 22) or any other normative stage theory. Selman (Note 7) has emphasized the dangers of attempting to formulate stage theories of social development which parallel those of physical and cognitive maturation. Social knowledge and behavior is by nature much more dynamic and dependent upon situational factors than are physical

TABLE 2

NEED AREAS*

Emotional Security--need to feel safe
Control--need to be recognized as competent
Respect--need for external reinforcement of competence
Expression--need to articulate thoughts and feelings
Economic Security--need for financial independence
Socialization--need to be with other people
Communication--need to be heard and understood
Interdependence--recognition of lack of omnipotence
Identification--need to establish sense of self
Experience--need for change
Maintenance--need to be healthy, sustain physical well-being
Utilization--need to use abilities appropriately, meaningfully

*Goldstein, Note 1.

and cognitive counterparts. Time, as it relates to the organization of content, is regarded, "as a function of growth and environments as they relate to growth" (Goldstein, Note 5, p. 22). Content is ordered, then, in terms of the need area(s) to which it relates, and the developmental environment(s) of which it is characteristic. The environments, self, home and family, neighborhood, and community, are seen as "amalgams of social, psychological, and organismic variables, which, in some way, have achieved almost criterion status as they relate to both time and social growth" (Goldstein, Note 5, p. 22).

The selection of expanding environments may be seen as a clear manifestation of the influence of the sociological perspective. The environments are similar to the "cores" which form the organizational structure of Hungerford's curriculum (Hungerford, DeProspo, & Rosenwerg, 1952) which was developed for mentally retarded children in the New York City public schools. Each of the cores of Hungerford's program was intended to correspond to a given chronological age. Cores and ages are:

The Home	7-9
The Neighborhood	10
The Borough	11
The City	12
Study of job areas	13
Ways of choosing, getting, and holding a job	14
Ways of spending one's income	15
The worker as a citizen and social being	16-17

(Goldstein, 1957, p. 16)

The specific objective of Hungerford's program was obviously vocational preparation. The SLC differs from the Hungerford curriculum in that vocational success is seen as a contributor to "life success" and not its equivalent. In addition, the SLC represents an attempt to be responsive to the social structure of the United States as a whole rather than to be responsive to particular sections. A major limitation of the Hungerford curriculum was its restrictive structure: It assumed a societal demand for unskilled and semiskilled workers. The validity of this assumption was affected by changes in demography and technology.

Attempts to modify the organizational structure so that it would be applicable across a heterogeneous social system can be found in the initiation of the environments with that of the self, the addition of the family to the core of the home, the omission of the borough, the

alteration of the city to the community, and the integration of the other core contents into all environments in a response to current and anticipated demographic and occupational patterns.

Structural Features of Process/Methodology

The selection of content is a necessary but not sufficient step in curriculum development for mildly handicapped learners. The content of the SLC is unique only in the comprehensiveness of the scope and sequence. Even there, the developers, make no claim to innovation (Goldstein, Note 3). Content provides the material for critical thought. Development of the ability to act independently requires a teaching method which assists the learner in acquiring systematic means of activating content.

A Gestalt learning theory provides a broad structural framework within which an instructional methodology which unifies the acquisition of content with strategies for activating that content can be identified. Designation of the nature of the methodology, the other structural dimension of the SLC, results from the integration of empirical data with specific learning theories. Empirical data from a number of research areas are important. Examples are learning characteristics of retarded people (Ellis, 1970; Prehm, 1968; Zeaman & House, 1963), problem solving skills of retarded children and adolescents (Rosenberg, 1963), expectancy of success or failure and willingness to continue a task after experiencing failure (Bialer, 1961; Cromwell, 1963; Moss, 1959).

On the basis of the findings of this and other research, a set of working conclusions was established. In comparison to nonretarded peers, mentally retarded persons:

1. Have poor retention of facts and concepts.
2. Are more likely to learn and retain facts than concepts.
3. Exhibit learning performance which correlates better with mental than with chronological age.
4. Have short attention span.
5. Have difficulty separating relevant from irrelevant cues.
6. Exhibit perseverative problem solving behaviors, (Goldstein, Note 5)

Just as the sociological perspective influenced the educational assumptions relating to content so does it influence the development of methodological assumptions. The goal of the socioeducational perspective of retardation is to reduce the probability of an individual's being assigned to a mentally retarded status as an adult. With this objective, the most critical research data is that which deals with the ability of mentally retarded people to solve problems. The other research data are important to the extent that the variables they reflect impact upon problem-solving skills.

At the time of the conceptualization of the methodological assumptions of the SLC, research on problem-solving skills of mentally retarded people was limited in number and quality. Rosenberg (1963) concludes a comprehensive review of the existing studies by lamenting "the neglect of problems of statistical design, terminology, and the logic of formal theoretical and research methodology" (1963, p. 458).

A variety of experiments was conducted by Bialer (1961), Cromwell (1963), and Moss (1959) in which the principles of Rotter's (1954) Social Learning Theory (SLT) were applied to the behavior of mentally retarded subjects. A basic hypothesis for many of the studies was that mentally retarded children and adolescents would be more motivated to avoid failure than to achieve success. In the case of problem solving, failure avoidance might be manifest in very laborious and inefficient approaches to the resolution of the problem, reluctance to act at all,

or very rapid and impulsive action that terminated the encounter very quickly. After several studies, it became apparent that accurate interpretation of the results was obstructed by an inadequate concern for the subject's perception of the situation (Cromwell, 1963).

If "perception determines response" (Stagner, 1966, p. 70) and if "the unit of investigation for the study of personality is the interaction of the individual with his meaningful environment" (Rotter, 1954, p. 85), then it is indeed possible, that "what has been called experimentally induced failure may not have been failure" (Cromwell, 1963, p. 62). Researchers did not give adequate consideration to the nature of the problem within the context of the meaningful environment of the subjects. Moss continued this line of research after this realization and did so within the framework of a field evaluation of special education intervention (Goldstein et al., 1965).

From a socioeducational perspective, focus on the process of problem solving meets two objectives. First, it is congruent with the "social utility theory of curriculum" (Glennon, 1975) which guided selection of content. Second, it provides "a legitimate teaching-learning transaction with one of the major acquisitions being a strategy consistent with the effective processing of data" (Goldstein, Note 5, p. 34).

Inductive Problem Solving Process

Within the framework of a cognitive Gestalt approach to learning, a second methodological feature can be placed. This feature is a pedagogical procedure which can

> effect a working union between the content of learning and the tactics for processing such content (reasoning) into productive

> behaviors (strategies) which will become integrated procedures in the learner's interactions with his environment. (Goldstein, Note 5, p. 36)

Reasoning, as it relates to pedagogical procedures, can be reduced to two basic types: inductive and deductive.

> For the purposes of teacher-pupil transactions, inductive reasoning is a process in which the solution to a problem is obtained by proceeding from the specific elements of the problem to the totality of the problem itself and ultimately to the rule or principle underlying its solution. Deductive reasoning, on the other hand, starts with the problem and already internalized rules relevant to the solution of that class of problem and proceeds to the specifics of the situation which guide the learner to the conclusion appropriate to the problem at hand. (Goldstein, Note 5, pp. 36-37)

The research on problem-solving abilities of mentally retarded people which was available during the formative stages of the SLC was at best equivocal, i.e., it offered no conclusive evidence regarding the capabilities for reasoning. The data from many areas of research with retarded subjects (problem solving, learning characteristics, personality motivation factors, etc.) indicated that any instructional intervention would have to be explicit in formulation and execution.

The task was to select a reasoning process and to formulate a procedure for integrating that process with the specified content in a pedagogical situation. The working conclusions postulated from the review of learning research with retarded children supported the selection of an inductive reasoning process. In addition, there was an historical precedent for the inductive approach in the work of Sequin (Goldstein, 1957).

> Piaget and Bruner, among many others, emphasize the need for maturing children to acquire rules and principles for organizing experiences and thought so that they can cope with the world around them before and on reaching maturity. Given this, we can say that the indicated strategy in the education of EMR children is one that capitalizes on inductive logical reasoning

> under the assumption that these children, like younger normal children, need to build a repertory of rules and principles for problem solving. (Goldstein, Note 5, p. 38)

Once the reasoning process has been identified, the objective is to formulate a pedagogical procedure. The formulation of this procedure must occur within a context of restricting parameters. The procedure must be congruent with content and it must fit within the structural framework of the cognitive Gestalt or the Mass-Differentiation-Integration conceptualization of learning. In addition, the nature of the global objectives of the SLC require that "inductive reasoning is cast in the teaching-learning framework as both a process to be employed and a trait to be instilled and obtained" (Goldstein, Note 5, p. 47).

The procedure developed in accordance with these specifications is the Inductive Problem Solving Process (IPSP). This process is integrated with content through the format employed for presenting the information. Each step in the IPSP was developed to be congruent with a portion of the learning Gestalt, i.e., the Mass, Differentiation, or Integration stage of learning. The IPSP is composed of five behaviors which are categorized into three stages of behaviors: information gathering, information processing, and information application.

In terms of the Gestalt theory of learning, the teacher selects an objective. Content relative to that objective is expressed in a problem-solving format. This objective (if it has been properly selected) represents the Mass. The Mass is an undifferentiated whole which as an entity is new to the learner. The first step in dealing with the Mass is to relate it to the "meaningful environment" (Rotter, 1954) of the student. In order to accomplish this, the Mass must be broken apart or differentiated. In the Differentiation phase of the learning

experience, the information-gathering behaviors of the IPSP are applied. They are labeling and detailing.

Labeling, the identification of component elements, is the first step in problem solving. With regard to the development of inductive reasoning as a trait which is manifest in independent action, the teacher intentionally presents a Mass which will create a disequilibrium (Stagner, 1961) in order to sensitize the learner to the existence of a problem. Clearly, a person cannot become skillful at solving problems if he/she is unable to recognize the existence of a problem.

The next step in inductive reasoning is detailing. Detailing is a more focused data-gathering behavior which is important for several reasons. First, the goal of the teacher in selecting the objective is to confront the learner with an experience which will disrupt the psychological homeostasis; the nature of the reaction to the disequilibrium depends, in large part, upon the extent to which the learner perceives the Mass as manageable. By helping the student detail or differentiate relevant from irrelevant information, the teacher guides the learner in relating elements of the Mass to his/her "meaningful environment." This action increases the probability that the experience of encountering a Mass will come to acquire a positive valence (Stagner, 1961); the Mass is no longer regarded as an overwhelming unknown, but rather as a composite of familiar and unfamiliar elements. Through this guidance, the teacher also "establishes the relationship between what is labeled and its character as they have bearing on the given problem" (Goldstein, Note 5, p. 59).

The next category of behaviors in the IPSP is information-processing. This classification includes inferring and

predicting-verifying. Inference may be seen as the behavior which links critical thought with independent action. The data gathering skills are predominantly content oriented; certainly action is involved, as the title of the category (data gathering) indicates, but the learner is not required to act on the content. Inference is the first step in the process of activating the content. This step in the IPSP provides the teacher with important diagnostic information. The quality of the inferences depends upon the quality of the labeling and detailing.

The second information-processing behavior is predicting-verifying. At this stage, the learner is required to select one option from among those presented at the inference stage. After making a commitment to a single inference, he/she must verify logically the consequences of acting on the inference. Predicting-verifying is an intentionally joined behavior. The objective of establishing skill in inductive reasoning as a trait requires that the student form a habit of evaluating the effectiveness of his/her behavior.

The last step of the IPSP represents the beginning of the Integration phase of learning. From the experiences of gathering and processing information in an established sequence of steps, the students should be able to reconstruct the Mass so that it can be assimilated into the meaningful environment. This step is called application of information or generalization. In terms of the pedagogical situation, this step is reached when the student can articulate a rule, i.e., he/she can combine and apply concepts in response to specific kinds of relationships over a variety of situations. From the perspective of the SLC, the statement of a rule comes in a "whenever"

(Goldstein, Note 1) or "if" statement (Goldstein, Note 5), i.e., whenever one is confronted with this type of stimulus array, one does this. The ability to state the rule is not equated with the demonstration of independent action; indeed, the mere articulation of the rule may be misleading.

The ultimate objective of the SLC is to enable the child to function successfully as a self-mediator. This is accomplished by the gradual and carefully planned transmission of the mediational responsibilities from the teacher to the learner. If a mentally retarded child is to become a competent self-mediator, this transmission must be carefully structured around the following principles:

1. The teacher must select and organize content which is congruent with the meaningful environment of the learner.
2. The teacher must verify that the learner sees the connection between the facts being presented and his/her own needs.
3. Perception of relevance by the learner increases the probability that mastery of facts will be inherently reinforcing.
4. The teacher presents increasingly more complex facts (the basis for critical thought) through rote instruction.
5. When the learner has assembled an adequate repertoire of facts, the teacher guides the child in assembling facts into concepts through the Logical Inductive Method (LIM).
6. The LIM provides a consistent pattern which involves the learner so that he/she discovers himself/herself competent to manage his/her own behavior and internalizes the pattern as a problem-solving strategy. (Goldstein, Note 8)

The possession of an internalized problem-solving strategy in combination with the belief that one is competent to manage one's own behavior constitutes the essence of self-mediation.

> The role of the teacher as mediator becomes absorbed by the learner who then mediates his learning and actions. Having the capacity to mediate one's learning, behavior, etc., is the wherewithall for acting independently. (Goldstein, Note 8)

Because the theoretical base of the SLC focuses upon the extrinsic value of education, the ultimate criterion for the evaluation of the

curriculum's effectiveness must be postschool adjustment of children who have been taught with the program. The fact that a student can exhibit behaviors which reflect skill in thinking critically and acting independently within the classroom only increases the amount of confidence that can be placed in a probability statement regarding his/her skills outside the classroom. Mastery of content and internalization of the IPSP guarantees adult adjustment no more than satisfactory performance in any educational program guarantees its application. The helical organization of content in conjunction with the repetitive presentation of sequential problem-solving behaviors is congrent with a goal of adult postschool adjustment, a socioeducational perspective or retardation, and a social utility theory of curriculum (Glennon, 1975).

Instrumental Enrichment: The Theory

Perspective Toward Retardation

Classification systems, like theories, are useful to the extent that they promote understanding of a phenomenon. Four basic perspectives toward the phenomenon of mental retardation have been identified: medical, psychological, educational, and sociological. Efforts to specify the perspective of the SLC led to the conclusion that the curriculum does not manifest any of the perspectives in pure form but is more accurately understood as socioeducational in orientation.

Similar attempts with Feuerstein's work affirm the notion that the primary value of the four perspectives is in serving as ideological reference points. Instrumental Enrichment, like the SLC, does not fit into any single orientation toward retardation. It is more

appropriately seen as psychoeducational, representing a combination of the psychological and educational approaches.

Interestingly, Feuerstein's work differs from that of traditional proponents of a psychological perspective in precisely the same way that Goldstein's work can be differentiated from that of those who espouse a sociological orientation: It focuses on intervention. The educational emphasis of Feuerstein's work is concentrated on ameliorating the condition of retardation through improving basic psychological processes.

Psychological Influence

Feuerstein (1980) discusses three major psychological positions which have influenced the nature of research associated with human behavior in general and intellectual functioning in particular. They are psychoanalysis, behaviorism, and psychometry. Although the behavioral approach has become increasingly accepted (Bijou, 1968), the psychometric model has dominated concern with deficient intellectual functioning and therefore is generally considered the traditional psychological perspective. This approach began with the work of Galton (Maloney & Ward, 1979) and has been continued with that of Binet and Simon (1905, 1914, 1916), Terman (1916), Thurstone (1927, 1931), Wechsler (1944, 1958), Cattell (1963, 1971), and Guilford (1967). This perspective has had its primary impact upon intervention through the use of standardized intelligence tests which adopt a "statistical model of normality" (Mercer, 1973).

While the proponents of the traditional psychological perspective from Galton to Guilford have regarded intelligence in terms of a factorial

and psychometric orientation, Piaget conceptualizes intelligence in terms of processes. He speaks of intellectual development as progressive and repetitive movement from structural disequilibrium to equilibrium (Hall, Note 9).

Working from a process conceptualization of intelligence, Feuerstein (1970, Note 10) has concentrated upon the specific issue of differential cognitive development. Galton's work (1869, 1883) may be regarded as the initiation of efforts on the part of psychologists and educators to identify variables relating to the fact that some individuals learn and understand more efficiently and effectively than others (Maloney & Ward, 1979). A variety of factors have been postulated as having causal influence on ability to learn. Common examples are heredity, organicity, quality and quantity of environmental stimuli, characteristics of parents or caregivers such as socioeconomic status, and educational level (Feuerstein & Rand, 1974).

Feuerstein (1979; Feuerstein & Rand, 1974) considers these factors inadequate because the relationship between each and the exhibition of retarded performance is far from perfect.

> The question, however, . . . is what is the mechanism through which these various environmentally determined factors end up producing a given level of cognitive functioning. Thus poverty . . . does not equally affect all individuals striken by it. There are many instances in which children from poor families reach high levels of functioning despite the adverse conditions in which they were brought up. Organicity as well as emotional disturbance and deprivation do not always and not necessarily result in low cognitive development. (Feuerstein & Rand, 1974, p. 10)

Feuerstein (1979, 1980, Feuerstein & Rand, 1974; Feuerstein, Note 10) resolves the dilemma by proposing that the previously mentioned factors influence cognitive development indirectly, i.e., they are distal

determinants of cognitive functioning. In the terminology of American research and intervention, these conditions operate to place children "at risk." The direct influence and the factor responsible for variations in cognitive performance is the extent to which the child receives mediated learning experiences (MLE); "Mediated learning experience is considered by us as the proximal determinant" (Feuerstein & Rand, 1974, p. 13) of differential cognitive development.

Feuerstein thinks that the human organism interacts with the environment through two experiential modalities: direct exposure and mediated. The direct exposure modality is characterized by the immediate, unaltered, and random interaction between the person and the environmental stimuli. This type of learning is predominantly a chance occurrence, i.e., the nature of the stimuli and/or the order in which they appear are incidental.

The manner in which the individual responds to the stimuli changes qualitatively and quantitatively with maturation. From a Piagetian perspective, the nature of change is a function of the reciprocal processes of assimilation and accommodation. Assimilation is "the incorporation of objects into patterns of behavior" (Piaget, 1960, p. 8). Accommodation is the opposite process in which the individual alters thought patterns or actions to fit environmental demands. Formulistic representation is S-(O)-R or stimulus-organism-response (Piaget, 1960, cited by Feuerstein & Rand, 1974).

MLE, on the other hand, is defined as "the training given to the human organism by an experienced adult who frames, selects, focuses, and feeds an environmental experience in such a way as to create appropriate learning sets" (Feuerstein, Note 10, p. 6). The basic

formula of direct-exposure learning is altered by the insertion of the human mediator: S-H(Or)-R or Stimulus-Human Mediator-Organism-Response (Feuerstein & Rand, 1974).

Mediated learning experiences are characterized by four criteria. The first defining characteristic is the intentionality of the mediator and the child. The mediator makes a concerted attempt to emphasize to the child the importance of the experience and in so doing "to produce in the child a state of vigilence" (Feuerstein, Note 11).

The second criterion of MLE is the transcending principle. The action of the mediator should exceed the demands of the particular situation in such a way that the needs system of the learner is enlarged (Feuerstein, Note 11). In order to comply with this principle, the mediator schedules the appearance of stimuli and controls their intensity and reappearance. In so doing, the mediator establishes the basis for temporal and spatial orientations and for movement from concrete to symbolic representation. He/she also groups stimuli to initiate a foundation for relational thought and comparative behavior.

The third requirement of MLE is the mediation of meaning. The mediator must "ascribe meaning to the task and emphasize the value of his/her action" (Feuerstein, Note 11) if MLE is to have maximal impact upon the child. Meaning can be established through verbal interpretation and through the selection and presentation of stimuli. The enthusiasm of the mediator is important in establishing mediation of meaning.

The final criteria of MLE is the mediation of competence. In order for this to occur, the child must first, succeed and second,

feel that he/she is responsible for his/her own success. The mediator must allow the child enough freedom with the stimulus to establish investment in the activity. The mediator then guides the child in the activity and in the interpretation of the activity.

Within the framework of this concept, cognition is regarded as inextricably related to other psychological processes such as motivational and attitudinal patterns.

> Instrumental Enrichment is based on a theoretical framework that takes into account the structure of intelligence of the retarded performer; the motivational aspects of his functioning, influenced not only by his cognitive but also by environmental and cultural dimensions that determine his needs system; and the necessity for his redevelopment as determined by the conditions of life in the modern technical society to which he must adapt. (Feuerstein, 1980, p. 105)

Educational Influences

Although his perception of intellectual development has been heavily influenced by the scholars of the "Genevan School of Piaget," Feuerstein (1970) is very concerned with the impact of educational intervention on cognitive skills and abilities. He specifies a continuum of intervention approaches ranging from passive-acceptant to active-modification.

The passive-acceptant approach emphasizes changing the environment to fit the individual with a pessimistic perception of the individual's ability to change. In contrast, the active-modification orientation "says that an individual can be encouraged out of a marginal, parasocial kind of existence and made to be actively interested in living a fuller life by means of active intervention strategies" (Feuerstein, 1970, p. 345).

In keeping with the psychological process orientation, this intervention emphasizes teaching mental operations rather than content. It differs from programs of similar orientation in the United States, particularly the work of Frostig (1967, 1968) and Kirk, McCarthy, and Kirk (1968), in focusing on cognition rather than perception. Concern is extended past the manner in which information is received to include procedures which are used to process and apply information. Examples of specific cognitive skills are associative clustering, rehearsal, coding, categorization, elaboration, and verbal abstracting (Haywood, Note 6). The primary objective of Feuerstein's work is to teach persons who exhibit retarded performance to think more effectively by modifying higher mental operations. The educational orientation is emphasized by the fact that the school is seen as a basic agency of intervention.

Nature of the Theory

"IE is the applied aspect of the theory of cognitive modifiability" (Feuerstein, Note 11). The theory of cognitive modifiability has been explicitly stated. Cognitive modifiability refers to

> structural changes or changes in the state of the organism brought about by a deliberate program of intervention that will facilitate the generation of continuous growth by rendering the organism receptive and sensitive to internal and external stimulation. (Feuerstein, 1980, p. 9)

The basic assumption of the construct of cognitive modifiability is that the individual is an open system.

> In this framework, modifiability is considered to be the basic condition of the human organism, and the individual's manifest level of performance at any given point in his development cannot be regarded as fixed or immutable, much less a reliable indicator of future performance. Tangible expression of this viewpoint is evident in the rejection of IQ scores as reflective

> of a stable or permanent level of functioning. Instead and in accordance with the open system approach, intelligence is considered a dynamic self-regulating process that is responsive to external environmental intervention. (Feuerstein, 1980, p. 2)

The goal of structural change, or the modification of cognitive structures, is to "produce in the child the capacity to initiate and maintain structural processes" (Feuerstein, Note 11). In other words, the objective is to enable the child to become a "generator of knowledge" (Feuerstein, 1980) by the appropriate use of basic mental operation such as discriminating, associating, analyzing, and generalizing (Haywood, 1977).

This goal is accomplished by changing the organism (through MLE) in two basic ways. The first is increasing the capacity of the individual to integrate experiences into a relevant whole. In this way, the system of cognitive functioning is cohesive and particular experiences are integrated in a manner which will effect the whole. The second alteration in the organism is the development of the ability to interpret change as transformation. This means that the child is able to engage in active rather than static thought. "Changes which occur in the child will undergo constant transformation and by this be generalized over many areas of functioning" (Feuerstein, Note 11).

Relationship to Theory to Intervention

Theory

Instrumental Enrichment "is the applied aspect of the theory of cognitive modifiability" (Feuerstein, Note 11). The concepts of cultural deprivation and mediated learning experience facilitate the the development of the intervention program. Cultural deprivation is

a syndrome which includes a number of deficient cognitive functions. The assumption upon which the intervention rests is that through the provision of an instructional program which compensates for the lack of MLE, the deficient functions can be remediated.

Working from this assumption, the first step in the development of the intervention is the specification of the nature of the deficient functions. Globally, focus is directed to "deficiencies in those functions that underlie internalized, representional and operational thought" (Feuerstein, 1980, p. 71). The deficient functions have been identified, for the most part, "through dynamic clinical assessment using the Learning Potential Assessment Device" (Feuerstein, 1980, p. 71). The primary value of the list of deficient functions is heuristic; no claim is made to the empirical validation of the exhaustive nature of the functions or to their orthogonality.

The list of deficient functions is divided into four basic categories. Three of these correspond to the conceptual division of the mental acts into the phases of input, elaboration, and output. The fourth category, affective and motivational factors, is intimately related to the other three. Specific deficiencies are listed by category in Table 3.

Cognitive map. Once the cognitive deficiencies have been identified, a theoretical model must be established which can be operationalized in the form of materials and procedures. The strucutral feature which links the theory of cognitive modifiability to Instrumental Enrichment is the cognitive map. In essence, "this specifies the parameters by which a mental act can be analyzed, categorized and ordered" (Feuerstein, 1980, p. 105). Feuerstein and colleagues (1979, 1980) specify seven

TABLE 3

IMPAIRMENTS IN COGNITIVE FUNCTIONING

Input	Elaboration	Output
1. Blurred & sweeping perception	1. Inadequate perception or definition of problem	1. Egocentric communication
2. Impulsive exploratory behavior	2. Inadequate differentiation of relevant v. irrelevant cues	2. Inability to project virtual relationships
3. Impaired receptive verbal tools	3. Lack of spontaneous comparative behavior	3. Blocking
4. Impaired spatial organization	4. Narrowness of mental field	4. Trial & error responses
5. Impaired temporal concepts	5. Episodic grasp of reality	5. Inability to communicate verbal responses
6. Impaired conservation of constancies--size, shape, quantity	6. Impaired need for pursuing logical evidence	6. Lack of precision in communicating responses
7. Deficiency of precision in data gathering	7. Impaired interiorization	7. Deficiencies in visual transport
8. Incapacity to consider multiple sources of data simultaneously	8. Impaired inferential thinking	8. Impulsive, acting-out behavior
	9. Impaired strategies for hypothesis testing	
	10. Impaired planning behavior	
	11. Absence of verbal concepts on a receptive level; inability to express concepts	

Source: Feuerstein, R. The dynamic assessment of retarded performers: The Learning Potential Assessment Device. Baltimore: University Park Press, 1979.

parameters: content, operations, modality, phase, level of complexity, level of abstraction, and level of efficiency.

Content refers to the subject matter of the mental act. An operation is "an internalized, organized, coordinated set of actions in terms of which we elaborate upon information derived from internal and external sources" (Feuerstein, 1980, p. 106). Operations vary in difficulty from simple recognition and identification to more complex abilities such as seriation.

Modality is the form of expression of a mental act. Primary modalities are figurative, pictorial, symbolic, and verbal. The phase of the mental act is input, output, or elaboration. Level of complexity is concerned with "the quantity and quality of units of information necessary to produce a given mental act" (Feuerstein, 1980, p. 109). Level of abstraction refers to the nature of the stimuli upon which the mental act focuses. In a Piagetian sense, this parameter deals with actions on a continuum from the concrete presence of the stimuli to symbolic representation.

The conjunctive nature of the cognitive map is affirmed by the fact that it has been used to develop the instruments which comprise the intervention and is recommended for use in implementing that intervention.

> In our theoretical framework, the map, in conjunction with the inventory of deficient functions, explains cognitive behavior by analyzing it's components and locating and interpreting any weaknesses that may occur. Through a process oriented approach, the cognitive map and the repertoire of deficient functions enable a dynamic assessment of a child's functioning. The cognitive map also assists the examiner and teacher in the selection of instruments and techniques for their application according to the specific needs of the child. (Feuerstein, 1980, p. 112)

Intervention

The program developed to implement the principles of the theory of cognitive modifiability is IE. IE can be examined in terms of two general and one specific aspect. General issues are the goals and structure of the program; specific concern is the nature of the individual instruments.

Goals. Feuerstein (1980), and Feuerstein, Rand, Hoffman, and Miller (1979) emphasize that

> the major goal of Instrumental Enrichment is to increase the capacity of the human organism to become modified through direct exposure to stimuli and experiences provided by encounters with life events and with formal and informal learning opportunities. (Feuerstein, 1980, p. 115)

Six subgoals are also specified. The first is to correct "the deficient functions that characterize the cognitive structure of the culturally deprived individual" (Feuerstein, 1980, p. 115). Although the proximal determinant of cultural deprivation is insufficient MLE, distal determinants influence both the nature and extent of deficiencies. The objective of intervention is to modify all deficient functions with particular emphasis on those which are weakest.

The second subgoal is "the acquisition of basic concepts, labels, vocabulary, operations, and relationships" (Feuerstein, 1980, p. 115). This subgoal "represents the content dimension of the instruments which themselves are content-free" (Feuerstein, 1980, pp. 115-116). Since the concern of the theory and its intervention is the modification of cognitive functions, content in a curricular sense is important only to the extent that it is necessary for the mastery of cognitive operations. In a literal sense, this objective is more directly concerned with culture-free than content-free information. In this sense, it

is reminiscent of Cattell's (1963) fluid as opposed to crystallized intelligence.

The third subgoal of IE is the production within the learner of habits which produce intrinsic motivation. The conceptual basis for this subgoal is that learning will be maintained, transferred, and ultimately generalized only if the individual has an intrinsic motivation to employ what has been learned.

IE also has an objective, the production of reflection and insightful processes within the learner. A behavior which is quite common among mentally retarded persons is impulsivity. A personality characteristic which is equally common is an extrinsic locus of control or the feeling that one has little control over the events of one's life. This subgoal attacks both of these traits.

The last two subgoals of IE are closely related to the third and fourth objectives. They are to create task-intrinsic motivation and to help the individual who exhibits retarded performance acquire a perception of himself/herself as a generator of knowledge.

Structure. The intervention program is structured in terms of units, each of which is called an instrument. This term was purposefully selected to emphasize that the material itself was developed as a means to an end rather than an end to itself. Although each instrument addresses a particular cognitive function, the tasks included in the activities of the instrument deal with a range of deficiencies. The instrumental nature of the materials influences the way in which the lesson is planned and presented, the character of teacher-student interactions, and the evaluation of performance.

> The shift from material as an objective to material as a tool has as its corollary a shift from project orientation to process orientation, with a corresponding emphasis on "how" rather than on "what." A student's errors are not merely recorded as evidence of his failures or as indicative of a need for further review of information, but their source is explored in terms of the parameters of the cognitive map to produce insight in the learning process. (Feuerstein, 1980, p. 119)

Instruments. The IE program consists of paper and pencil excercises organized as 15 instruments. The instruments provide a supplemental curricular activity; the material is intended to be used 3-5 hours a week over a 2- or 3-year period. The instruments can be divided into three major groups: nonverbal instruments, instruments requiring limited reading skills, and instruments requiring independent reading and comprehension abilities. Instruments are listed in Table 4.

The direct relationship between the theory of cognitive modifiability and IE is made graphic by examining the structural principles of the theory in terms of the intervention. According to the theory the proximal determinant of the cause of cultural deprivation is an absence or insufficiency of mediated learning experience. The syndrome is manifest in retarded performance which reflects deficiencies in cognitive processes.

> The Instrumental Enrichment program is an attempt to compensate for the lack of mediated learning experience by exposing low functioning adolescents to a series of tasks designed to modify the cognitive functions in which they are deficient. The program is not designed to teach content-specific units of information, but to provide the students with the prerequisites of thinking that will enable them to derive maximum benefits from direct exposure to either formal classroom curricula or any other experience that may facilitate their adaptation and integration into society. (Feuerstein, Rand, Hoffman, Hoffman, & Miller, 1979, p. 541)

Each instrument in the program can be analyzed in terms of the parameters of the cognitive map and the array of deficient functions.

TABLE 4

INSTRUMENTAL ENRICHMENT EXERCISES

Nonverbal	Limited Verbal	Applied Verbal
1. Organization of Dots	1. Orientation in Space I, II, and III	1. Temporal relations
2. Analytic Perception	2. Family Relations	2. Instructions
3. Cartoons	3. Classification	3. Transitive relations
	4. Numerical Progressions	4. Syllogisms
	5. Stencil Design	

Source: Feuerstein, R., Rand, Y., Hoffman, M., Hoffman, M., & Miller, R. Cognitive modificability in retarded adolescents: Effects of Instrumental Enrichment. American Journal of Mental Deficiency, 1979, 83, 539-550.

When a teacher uses IE, he/she is attempting to remediate retarded performance by acting directly upon the process deficiencies which underly the inadequate performance. A deficiency in cognitive functioning may manifest itself in a variety of school activities. Since the IE materials are in essence content free, the teacher focuses upon the cognitive processes using the IE material as vehicles to facilitate remediation. Through the process of bridging, the teacher helps the students relate the processes to school and daily-living activities.

Alteration in the manner in which a person perceives, organizes, analyzes, and communicates information and the consistent application of these alterations can produce multiplicative change in a child's learning performance. As amelioration solidifies through repetition and reinforcement, the child gradually assumes more and more responsibility for mediating experience. As this occurs, his/her ability to profit from direct exposure learning is greatly improved.

Theoretical Comparison: SLC and IE

The two curricular programs, Social Learning Curriculum (Goldstein, 1974a, 1975a, in press) and Instrumental Enrichment (Feuerstein, 1980) share a concern with amelioration or an educational perspective toward mental retardation; the extent of influence upon the educational perspective may vary qualitatively and quantitatively. The perspective adopted by SLC developers has been labeled socioeducational because the ultimate objective is to increase the probability that persons who have been designated retarded during their school years will be able to escape the status as adults. The proposed means for accomplishing this objective are equipping students with

knowledge and skills which facilitate development of abilities to think critically and act independently. The skills which support both critical thinking and independent action are the basic psychological processes which are the essence of the psychological perspective.

The theoretical position of the IE program has been called psychoeducational because the primary objective of the program is the improvement of fundamental cognitive processes with the concomitant alteration of affective correlates (Chapman & Boersma, 1980) of deficiencies in mental operations. These affective correlates include personality and motivational factors. The intense focus upon cognitive psychological processes obscures the sociological orientation of Instrumental Enrichment. The very essence of the active-modification approach to mental retardation is "adapting the retarded individual to the ever-growing and ever-changing requirements of a technological society" (Feuerstein, 1970, p. 343).

Both the SLC and IE, then, adopt perspectives which are combinations of the educational, psychological, and sociological orientations. The primary distinction between the programs can be found in the conceptualization of the process for implementing the sociological orientation. From Feuerstein's interpretation, deficiencies in cognitive functioning resulting from inadequate mediated learning experience are manifest in the syndrome of cultural deprivation. Without adequate intervention, culturally deprived individuals may lead a "marginal, or parasocial kind of existence" (Feuerstein, 1970, p. 345). If the basic psychological processes of the individual are altered significantly, the individual will then be able to benefit from direct exposure learning in such a

way as to alter his/her status in the social system. By remediating cognitive deficiencies, one teaches the student to think; the person who can think is then prepared to know.

Goldstein's interpretation of the sociological perspective and the intervention which has emerged from this interpretation reflects a pervasive concern with the impact of political and economic forces upon the individual's ability to alter his/her status in the system. The convergence of a democratic government and a capitalistic philosophy has important implications for intervention with children who have been classified mentally retarded. Successful participation in the mainstream of a democratic and capitalistic society "requires that individuals be socialized in the language, values, norms and perspectives of the public culture" (Farber, 1968, p. 254). This socialization requires that a person be taught not only to think but also to know.

IE focuses upon processes of abstract intelligence. "the ability to understand an manage ideas and symbols" (Thorndike, 1920, p. 222). These processes are congruent with "the educational traditions of Europe and North America" (Jensen, 1969, p. 7). The instruments are "content-free" and within the parameters of European traditions culture-free (Cattell, 1963). The SLC contains elements of abstract intelligence but deals also with social and mechanical intelligence, i.e., the ability to understand and manage people and things (Thorndike, 1920). The curriculum was developed for a specific population: children who have been designated mentally retarded within the American social system. Compared to IE, the SLC is neither content nor culture free.

The goal of IE is to remediate deficiencies in cognitive functioning and therefore to help the child "learn to learn." Focus is upon

cognitive processes because they are critical to all types of learning. The ultimate criterion for the evaluation of IE, then, is the extent to which the program succeeds in altering cognitive processes. Although the implicit assumption of the theory of cognitive modifiability and the IE program is that modification of abstract intelligence will lead to improvements in other areas, the basic criterion for the evaluation of IE must be the extent to which it succeeds in altering cognitive processes.

The goals of the SLC are to teach children to think critically and act independently. These objectives are based upon the assumption that there are the "two pervasive characteristics requisite to social competence in a society such as ours" (Goldstein, Note 3, p. 1). In evaluating the SLC, improvements in cognitive functioning are important as means to the end of social competence. The ultimate criteria for evaluating the SLC, then, is the extent to which pupils who have been taught with the program become socially competent as adults.

The theoretical base which supports the Instrumental Enrichment program has been carefully articulated; each instrument in the intervention is a direct outgrowth of the theoretical principles. The theory from which the SLC has been developed is implicit and the relationship of theory to intervention has been reciprocal.

CHAPTER II

REVIEW OF LITERATURE

The most cursory review of the literature of educational evaluation reveals that the issues of curricular assessment have generated voluminous response. Weiss (1972) stated that the purpose of evaluation research is to compare "what is" with "what should be." The prevailing characteristic of the literature of educational evaluation seems to be dissatisfaction with "what is" and disagreement over "what should be."

This chapter has several purposes. The first is to present a summary of the history of curricular evaluation. The second is to discuss three dominant theoretical perspectives and to identify the approach which guides this study. The final purpose is to review the empirical literature so that research questions may be proposed.

History of Curricular Evaluation

A review of the literature in the area of curricular evaluation shows agreement on only two points: (a) it should be objective, and (b) it should provide a judgement of some type. The proper means for demonstrating objectivity, the nature of the judgement, and most other aspects of the evaluation process from the identification of the goals to the reporting of the results are subjects of intense controversy.

The first experimental evaluation of American educational programs was conducted by Rice (1897). His work was a systematic examination

of the effectiveness of rote instruction (Merwin, 1969) or "the futility of the spelling grind" (Rice, 1897). Although Rice's work was very controversial, there were no replication attempts.

The refinement of procedures and techniques in educational psychology, particularly in terms of assessment (Binet & Simon, 1905; Terman, 1916; Thorndike, 1903, 1913), had great influence on the philosophical direction of educational research. The topic selected by the National Society for the Study of Education as the focus of its 1918 conference was "assessment of educational products." The papers of this conference, however, reveal little more than philosophical adoption of the "scientific" procedures.

Tyler's doctoral dissertation, Statistical Methods for Evaluating Teacher-Training Curricula (1927) became the seminal model for the implementation of these techniques. His work is particularly important for this discussion because it represents an attempt to unify testing theory with curriculum development. Prior to his dissertation, assessment had been considered the proper endeavor of educational psychologists and curricular activity in the responsibility of educators.

Tyler continued to influence, if not dominate, the field. In 1934, he identified the following topics as critical to American education.

1) The formulation of objectives "in terms of student behavior."
2) The use of these objectives as the focus of teaching and of testing.
3) The adoption of a broader view of the purposes of education.
4) Concern with techniques for evaluating "higher mental processes."
5) Broadening of the purposes of education and consequently educational evaluation to include concern with affective factors.

(Merwin, 1969, p. 82)

Tyler then attempted to operationalize his suggestions through a major evaluative effort: the Eight Year Study. This study is

important for several reasons. First, it was designed and implemented in such a way that it impacted upon researchers and practitioners. Second, it represented the initiation of large scale research funded by public and private agencies; the research was commissioned by the Progressive Educational Association and supported by the Carnegie and Rockefeller Foundations. Its purpose was to evaluate the extent to which educational institutions espousing a "progressive model" were achieving their objectives. Over 300 colleges participated and 29 schools "experimentally redesigned their curricula" in accordance with the objectives of the "progressive" philosophy.

The study had two parts. The first was "primarily concerned with developing means by which the achievement of students in schools could be appraised" (Smith & Tyler, 1942, p. 5). The second part of the study used a comparative design to examine the effects of progressive and traditional courses of instruction. The performance of 1,475 college students receiving progressive courses was compared with that of a similar number of students being taught in "traditional" programs. The students receiving the experimental treatments were judged to be superior to the comparison groups.

Although Tyler's work (1927, 1933, 1942) represents an integration of psychological concerns regarding tests and measurement with educational interest in program development, the union of the two fields was hardly solidified. While Tyler's work was ongoing, research of a more basic nature was being conducted on principles of learning. Thorndike's work, particularly the statement of the Law of Effect in 1913 and its revision in 1929, influenced the research of American learning theorists, Hull and Skinner. Both attempted to refine

Thorndike's position with Hull's advocating a "quantitative deductive" system (Hilgard & Bower, 1966) and Skinner's calling for a descriptive empirical approach.

In addition, another set of endeavors in the period of 1940-1953 is important to an accurate understanding of the history of educational evaluation. These were a series of publications dealing with the application of statistical analysis and experimental design to research in education. The primary proponent of these concerns was Lindquist with major publications in 1940, 1951, and 1953.

The activity associated with curriculum development and subsequent curricular evaluation increased dramatically with the passage of the National Defense Act in 1958 (Hamilton, 1977). Federal monies were allocated directly to efforts to improve curricula, particularly in the areas of science and math. In the mid 1960s, the concern over adequacy of curricula was extended to include educational programming for low income, minority, and handicapped children. Curricular evaluation "came of age" in 1965 "when continued financial support under Title I and Title III of the Elementary and Secondary Act was made contingent upon the submission of evaluation reports" (Hamilton, 1977, p. 330).

The response to the emphasis upon curricular evaluation was extensive. During this era, three major theoretical positions toward curricular evaluation emerged. The first, a comprehensive interpretation of a Tylerian rationale, was proposed by Cronbach and expanded by Scriven (1967) and Stake (1967a, 1967b). The second, the experimental position, was introduced by Campbell and Stanley (1966). The final theoretical approach also reflects the work of Tyler; it is the

instructiojal objectives model advocated by Popham (1969). The papers of Scriven (1967), Stake (1967b), and Popham (1969) appeared in a monograph series sponsored by the American Education Research Association begun 1967.

In terms of special education, two strong statements concerning the effectiveness of curriculum came in the 1960s. Goldstein, Moss, and Jordan (1965) focused on curriculum and teaching method in evaluating the efficacy of special education in Illinois, and Dunn (1968) called for a comprehensive network of special education curriculum development centers.

Major events of the 1970s include the development of other theoretical positions regarding curricular evaluation. The first was introduced by Provus (1969) and expanded by Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus in 1971. The focus of this model is upon the evaluator's role in facilitating rational decision-making. Other theoretical perspectives are the literary approach proposed by Eisner (1972, Note 12) and theory-based evaluation developed by Fitz-Gibbon and Morris (1975). In 1979, Cook and Campbell published an extensive discussion of problems peculiar to applied research issues including educational evaluation.

Theoretical Approaches to Curricular Evaluation

Three major theoretical approaches emerged in response to the demands for curriculum evaluation. They are the Comprehensive Tylerian Position originally proposed by Cronbach (1963) and expanded by Scriven (1967) and Stake (1967a, 1967b) the Experimental Approach espoused by Campbell and Stanley (1966) and the Instructional Objectives Approach

advocated by Popham (1964, 1967, 1969) and Glaser (1970). Each of the three positions can be traced to different historical precedents.

Comprehensive Tylerian Position

Cronbach (1963) adopted a "modified Tylerian rationale" (Hamilton, 1977) in suggesting that the purpose of evaluation research is to facilitate decision making "in the service of course improvement" (Cronbach, 1963, p. 675).

Scriven's (1967) position is an analytical expansion of that taken by Cronbach. He thinks that the identification of aspects of a program which need revision is a role rather than a goal of evaluation. He labeled this role formative evaluation. Formative evaluation occurs at an intermediate stage in the development of a program. Another role of evaluation is the "investigation of causal claim" (Scriven, 1967, p. 50), or the gathering of information for decision making, summative evaluation.

The essential activity of both formative and summative evaluation is judgement. The quality of the evaluation or the confidence that can be placed in the judgement depends upon the care and comprehensiveness with which it is justified. A meaningful evaluation of a curriculum requires the justification of judgements from the relevance, adequacy, and theoretical accuracy of the goals of the program to the interpretation of the data in terms of impact. The evaluator must justify judgements regarding the extent to which the content and processes of a program reflect its objectives, the program is effective in meeting its goals, the evaluation procedures assess the change the program is seeking to effect, and the evaluator's translation of quantitative results

into qualitative statements is adequate. The justification of this array of judgements requires that the evaluator concern himself/herself with construct validity and value judgements.

Scriven (1967) also emphasized that educational evaluation statements address what "usually" happens with an intervention rather than what "might" happen under optimal or maximally detrimental circumstances. In addition, he stressed that educational evaluation always occurs and must always be interpreted within the context of complex social structure. The dynamic interaction of an intervention with aspects of the social system reduces the likelihood of achieving simple effects or instant progress.

> The fact remains that is is probably the case that we shall often have to proceed in terms of rather small differences; that producing large differences will usually require a multiple push approach, one that attacks not only the curriculum but also the student-grouping procedures, the teacher presentation, the classroom time allocation, seeking above all to develop positive feedback via the long-term effects that improvements in every subject in the school curriculum will eventually produce for [illegible] general increase in the level of interest and preparedness. [illegible] is not too depressing a prospect. . . . We are perhaps too used to the discovery of miracle drugs or technological breakthroughs in the aerospace field to recognize the atypicality of such (apparently) instant progress. (pp. 66-67)

Stake (1967a, 1967b) thinks that judgement is only one of the basic evaluation activities; the other is description. Stake's concern with description may be attributed to his abiding respect for the complexity of the educational endeavor and the dangers of evaluation which underestimates this complexity. The evaluator must judge, but he/she must also ground his/her judgements in context through description.

Stake (1967a) stressed that three types of data, antecedent, transactional, and outcome, are ne[illegible]ary to describe an educational intervention. Antecedent data i[illegible]ll factors which precede the

implementation of the program. Transactional data are those which reflect encounters in the activation and evaluation of a curriculum. Outcomes, of course, are the changes which are regarded as the results of an intervention. Too often the sole focus of evaluation is outcome data where studies "begin and end with achievement testing" (Stake, 1967b, p. 5).

Experimental Position

Campbell and Stanley (1966) share the respect exhibited by the proponents of the first position for the impact of a variety of factors upon the process of educational evaluation. They think, however, that the most adequate means of dealing with these factors is through the careful use of principles of experimental design. The problems proposed by Cronbach, Scriven, and Stake in "rendering a judgement" may be more concisely considered as the lack of confidence manifest by educators in their ability to secure "adequate and proper data" (McCall, 1923, cited by Campbell & Stanley, 1966, p. 1).

The complexity of the environment in which educational evaluation research is conducted generates two basic concerns: (a) how much confidence can be evaluator place in his/her judgement that a given change can be attributed to a given intervention, and (b) how generalizable is that judgement? From the perspective of Campbell and Stanley, evaluation is composed of judging through the statistical analysis of data and describing through the systematic consideration of factors which may invalidate results.

The first concern, the confidence the evaluator places in the judgement, Campbell and Stanley (1966) termed "internal validity." With regard to internal validity, they proposed "eight classes of

extraneous variables" which "if not controlled in the experimental design, might produce effects confounded with the effect of the experimental stimulus" (p. 5). Threats to internal validity are listed and described in Table 5. The primary means of controlling threats to internal validity is through experimental design.

Campbell and Stanley then proposed that educational research activity may be classified as fitting into one of three types of experimental design: preexperimental, true experimental, and quasi experimental. The true experimental design is characterized by the ability of the researcher (or evaluator) to manipulate the independent variable and to randomly assign subjects to treatment groups. The use of a true experimental design effectively controls the threats to internal validity.

A quasi-experimental design is used when the researcher cannot control the manipulation of the independent variable and/or the randomization of subjects. The value of the quasi design is the opportunity it affords the evaluator to specify on an a priori and hence more objective, basis the factors which may act to invalidate results. Efforts can then be made to control these factors.

Internal validity deals only with the specific nature of a given judgement; it provides no basis for the application of that judgement to any other situation. The extent to which the results of a given experiment can be generalized to other situations Campbell and Stanley (1966) called external validity. They proposed threats to external validity; these are listed and described in Table 6.

The nature of the constructs of internal and external validity precludes a study's being both internally and externally valid. At

TABLE 5

THREATS TO INTERNAL VALIDITY

1. History
2. Maturation
3. Testing
4. Instrumentation
5. Statistical regression
6. Mortality

TABLE 6

THREATS TO EXTERNAL VALIDITY

1. Experimentally accessible versus target population
2. Interaction of treatment effects with subject characteristics
3. Multiple treatment interference
4. Interaction of history and treatment effects
5. Interaction of time of measurement and treatment effects
6. Pretest sensitization
7. Hawthorne effect
8. Novelty and disruption effect
9. Experimenter bias

some point in the design of the evaluation, then, the researcher must make decisions based upon the purposes of the research. These decisions may be considered, in Scriven's (1967) terms, "value judgements."

Instructional Objective Model

The third theoretical position toward educational evaluation may be seen as an integration of the work of Tyler with that of Skinner. Primary advocates of this position have been Popham (1964, 1967, 1969) and Glaser (1970). Prevalent characteristics of the approach are the specification of program objectives in behavioral terms, the careful assessment of the "entry behavior" or "initial state" of the learner, the data-based-monitoring of instruction, and the assessment of progress in meeting goals through a criterion-referenced approach.

Although proponents of this position are sometimes grouped with advocates of the comprehensive-Tylerian approach as sharing a concern with "goal-referencing evaluation" (Worthen & Sanders, 1973), Popham's position is radically different from Scriven's in a critical way. He differentiates curricular evaluation from instructional evaluation; the function of the evaluator is to determine the extent to which a program succeeds in achieving its objectives; the evaluator has no responsibility for making judgements regarding the theoretical adequacy of the objectives.

Working from the assumption "that the only defensible kind of instructional model must be based on an assessment of whether or not the learner's behavior is actually altered" (Popham, 1969, p. 38), Popham provided an objective means for dealing with the three types of data

specified by Stake (1967a) as critical to an evaluation: antecedent data, transactional data, and outcome data. The evaluator focuses upon observable behaviors which are relevant to the achievement of the objectives. In terms of antecedent data, "detailed diagnosis is made of the initial state of a learner coming into a particular instructional situation" (Glaser, 1970, p. 73). Transactional data include the monitoring of delivery of instruction, again in terms of clearly specified and observable behavior. Outcome data typically take the form of criterion-referenced assessment which may or may not be accompanied by normative evaluation.

Adoption of a Theoretical Perspective

The theoretical position adopted in this study was a combination of the comprehensive Tylerian approach espoused by Cronbach (1963), Scriven (1967), and Stake (1967a, 1967b) and the experimental position advocated by Campbell and Stanley (1966). The research had two goals: (a) to describe as clearly and carefully as possible what happened before, during, and after the implementation of the SLC and IE; and (b) to judge the effectiveness of the programs. The structural framework used to meet these goals was the threats to validity established by Campbell and Stanley (1966) and Cook and Campbell (1979).

This approach is congruent with the theoretical foundations supporting the SLC and IE. Both programs are cognitively oriented and both reflect concern on the part of developers with the issues of construct validity and value judgements. In addition, both programs reflect a respect for the school as a social institution.

Review of Empirical Literature and Postulation of Research Questions

The amount of research activity in the area of educational evaluation has increased dramatically since 1960. For the purposes of this study, the literature review was limited to curricular evaluation which incorporated the characteristics of the comprehensive Tylerian approach (Cronbach, 1963; Scriven, 1967; Stake, 1967a, 1967b) and/or experimental (Campbell & Stanley, 1966) approach. This restriction precluded discussion of Flanagan's (1969) Project TALENT, Flander's (1970) interactional studies, Gallagher's (1970) observational work with gifted children, Tyler's (1966) National Assessment of Educational Progress, and Neeley and Lindsley's (1978) instructional objectives evaluation of different reading programs.

Federally Funded Projects

A major portion of the literature of curricular evaluation focuses upon the effectiveness of federally funded intervention projects. This includes the evaluations of massive programs such as Head Start and Follow Through and the smaller scale interventions which preceded them. Two of the earliest and most influential projects are the Early Training Project (ETP) (Gray, Klaus, Miller, & Forrester, 1966; Gray & Klaus, 1970; Klaus & Gray, 1968) and the Perry Preschool Project (PPP) (Weikart, Deloria, & Lawler, 1974).

In the ETP, 61 children, selected on the basis of race and socioeconomic status (SES), were randomly assigned to one of three treatment groups. Children in the first group (T-1) received three summers of intervention and three years of home visitation; children in the second group (T-2) had two years of summer programming and home visitation;

the third group served as the local control. A distal control group was also identified to provide some protection against the "diffusion of effect" within the community.

The program of the ETP differed from "conventional preschool programs" (Klaus & Gray, 1968, p. 11) in three ways. First, a concerted effort was made to use conventional methods creatively to achieve carefully specified cognitive and affective goals. Second, the teacher-pupil ratio was quite high and third, the activities were selected on the basis of their potential contributions to later school success.

Both cognitive and affective variables were assessed. Performance in cognitive areas was evaluated with normative intelligence and achievement tests. The experimental children (T-1 and T-2) exhibited significantly superior performance in these areas until the children were in the fourth grade, at which time the effects appeared to dissipate.

A variety of procedures were used to assess affective variables such as reflectivity, self-concept, and ability to delay gratification. No significant differences were found between E and C children in these variables. Gray, Klaus, and Ramsey (Note 13) propose two explanations for what appears to be "an entirely unsuccessful" attempt to impact upon affective variables. The first is that the program actually had no effect in the area. The second is that the instruments used to assess the variables lacked the psychometric qualities of their cognitive counterparts.

Weikart used a cognitively-oriented curriculum grounded in Piagetian theory with five "waves" of children from 1958 to 1962

(Weikart et al., 1974). Children were selected as candidates for the program on the basis of IQ and SES and were randomly assigned to experimental or comparison groups. Experimental children were taught half a day, five days a week from October to May for two years. The experimental children showed superior gains in IQ. In contrast to the children in the ETP, the school performance of the E children improved over time. At the eighth grade, their California Achievement Test scores were significantly superior to those of control children (Weikart et al., 1974).

Research and demonstration projects of this type were influential in the development of massive intervention programs such as Head Start and Follow Through. Much of the literature focusing upon educational evaluation procedures was stimulated by dissatisfaction with attempts to evaluate the effectiveness of these programs. [illegible] most important evaluation in terms of generating respo[illegible] the study conducted by the Westinghouse Learning Corporation and Ohio University on the effectiveness of Head Start (Cicarelli, 1969). The primary conclusions of the Ohio-Westinghouse Study were that full-year Head Start progra[illegible]ar to have "marginal effects on cognitive development which can still be detected in grades one, two, and three" (Smith & Bissell, 1970, p. 52) but have no significant impact upon affective development, that summer programs have little effect on performance in either area, and that Head Start children remain below expected performance on Stanford Achievement Test and Illinois Test of Psycholinguistic Ability (Smith & Bissell, 1970).

The discussion around all aspects of the study (Cicirelli, Evans, & Schiller, 1970; Smith & Bissell, 1970) reached debate proportions

and influenced a more careful conceptualization of the "planned variation" approach of the Follow-Through intervention. Under the Follow-Through program 24 different "models" were selected. This allowed the evaluation of the effectiveness of each model and the comparison of one model with another.

By 1973, six years after the conception of the program and four years before the completion of the evaluation report, principal participants were lamenting the ambiguity of preliminary findings (Rivlin & Timpane, 1975). The final evaluation report (Anderson, St. Pierre, Proper, & Stebbins, 1978) rendered three primary judgements:

1. The effects of the different models were characterized by variability with none of the models demonstrating "that it could compensate consistently for the academic consequences of poverty."
2. Children served by Follow Through did not exhibit superior performance on standardized achievement tests.
3. The majority of children served by Follow Through were still functioning substantially below grade level after three or four years of intervention. (p. 162)

This evaluation was no more positively accepted than its Head Start predecessor. Indeed, House, Glass, McLean, and Walker (1978) refer to the assessment as "an unfair evaluation" (p. 132). This judgement is based upon what they perceive as problems in the classification of the models as basic skills, cognitive-conceptual, and affective-cognitive, the selection of criterion measures, and the use of analysis of covariance for examining the data.

Smaller Scale Evaluations

Other research has been conducted on a smaller scale. Burton (1971) evaluated the effectiveness of three curricular programs developed to teach English to junior high school students. Fifty-four

teachers in six different schools served as experimental teachers; there was a control group in each school. At the end of the third year of intervention, students were tested with five tests, each of which was developed by curriculum center personnel. Experimental subjects were superior to controls on all measures, but there was no difference in performance among the experimental groups.

Hungerman (1967) studied the effectiveness of "contemporary mathematics curricula" upon mathematics performance. Two urban school systems participated in the study with 10 classes of children using the School Mathematics Study Group Program (SMSP) in grades 4 through 6. Ten comparison classes used traditional programming. At the end of the sixth grade, four tests were administered to 565 participating children. The results are interesting in that there were significant differences in favor of both experimental and control children depending upon the content of the test. Comparison children scored higher on both sections of the California Arithmetic Test while the E children performed significantly higher on the California Contemporary Mathematics Test; there was no difference reported on the Aiken-Dreger Mathematics Attitude Scale. No pretest data were reported or was there information regarding the standardization of the instruments.

Sheldon, Nichols, and Lashinger (1967) used the Stanford Achievement Test (SAT) among others to examine the effectiveness of three reading programs: Ginn Basic Readers, Singer Structural Reading Series, and Bloomfield-Barnhart Let's Read. The SAT was administered to all children in the 21 participating classes (N=367) on a pretest-posttest basis. No one program was shown to be superior to any other.

Lieberman and Selman (Note 14) evaluated the effectiveness of a cognitive developmental curriculum upon the moral stage development of primary children. Six classes of children (N=68) participated in the study; four of the classes used the experimental curriculum while two served as comparison. In the four experimental classes, two of the teachers were given training in cognitive developmental theory.

The dependent variable in the study was stage of moral development as measured by performance on three types of moral dilemmas. Experimental children received instruction based on the curriculum twice a week for a full year; they were tested at the beginning, middle and end of the school year. The experimental children exhibited performance which was statistically superior to that of comparison children. There was no difference in the performance of children taught by teachers who had received training and those who had not. "In fact, the biggest gains occurred, not in an expert-led class, but in the class of the lay teacher who showed the greatest interest in the program, its techniques, and the underlying theory (Lieberman & Selman, Note 14, p. 8).

Welsh (1969) reviewed curricular evaluation literature in science education following a period of intense activity in the field stimulated by the National Defense Education Act of 1958. After carefully examining 46 major projects, he reached the following conclusions.

1. Nineteen projects reported the use of a control group.
2. Eight projects indicated "some attempt" at summative evaluation.
3. Four of the 19 projects employing control groups used random procedures to assign subjects to treatment conditions.
4. Published studies used "some type of experimental design".
5. There was indication of movement away from the exclusive use of questionnaires for instrumentation.
6. Problems of multiple t tests, regression toward the mean, inaccurate degrees of freedom for statistical tests, and failure to use covariate adjustment pervaded the literature. (p. 440)

Welsh's review is particularly distressing when one considers the extent of concern, even at the lay level, for the efficacy of science and mathematics programs during this period.

Curricular Evaluation in Special Education

In 1968, Dunn called for the establishment of a national network of special education curriculum development centers. It is significant in reviewing special education curricular evaluation studies to consider that special educators were calling for curriculum development centers at approximately the same time educators in other areas were demanding more rigorous application of research principles to summative evaluation.

It is also important to realize that the field has generated little response to Dunn's challenge. As late as 1977, Cawley said,

> I do not believe we have adequate curricular alternatives today. Nor do I believe that we have ever had adequate curricular alternatives. I hate to think that Public Law 94-142, the Education for All Handicapped Children's Act . . . is going to place millions of dollars into a system of education which has yet to validate alternative curricular models and programs to meet the needs of these children. (p. 25)

An accurate perspective on the status of curricular evaluation in special education will necessitate a flexible definition of curriculum and evaluation. Curriculum will include a specified array of content, process, or content and process; evaluation will refer to experimental studies of a summative nature.

In 1965, Goldstein, Moss, and Jordan conducted a "true experimental" study (Campbell & Stanley, 1966) of the effectiveness of special education programming using the Illinois Curriculum Guide (Goldstein & Siegle, 1958). Selection of subjects for the study involved the screening of 1938 entering first-graders in school systems which had no special

education programs with the Primary Mental Abilities Test (PMA). Children who scored at or below 85 on the PMA (N=209) were tested with the Stanford-Binet Intelligence Scale-Form L (SB). The 129 who "qualified" as educable mentally retarded (IQ below 85) were randomly assigned to regular first grade or special education classes. The children were monitored for four years in three areas: intellectual functioning, academic achievement, and personality/social adjustment. An array of standardized measures was used for the first two dependent variables. Personality and social adjustment were assessed via experimental procedures, specifically developed instruments, and interviews with parents. Teachers in the special education classes used the Illinois Curriculum Guide (Goldstein & Sieglé, 1958) in conjunction with an inductive teaching methodology.

The hypotheses of the study were that the intellectual, academic, and personality development of retarded children served in special classes would significantly exceed that of similar children served in regular programs. Analyses of the data in accordance with the stated hypotheses revealed no significant differences except in certain areas of personality development.

A post hoc analysis of the data was stimulated by the fact that many children in both special and regular classes performed so much better on the second administration of the SB that they could no longer be legitimately regarded as mentally retarded. The average terminal IQ of the children (the average of the scores from the last two administrations of the SB) was used to divide the children in high IQ (81+) and low IQ (80-). This resulted in four groups of children: High

Ability Special Class; High Ability Regular Class; Low Ability Special Class; Low Ability Regular Class.

Within these four groups of children, the original hypotheses were reexamined. In terms of intellectual development, the High Ability children in either type of program showed increased IQ scores over the four years of intervention. The Low Ability children exhibited increases in IQ during the first year. In subsequent years, their scores decreased so that their terminal IQs were approximately the same as the entry IQ. Post hoc analyses in the area of academic achievement revealed significantly superior performance by the Low Ability Special Class children in reading and language, arithmetic, and social information. In addition, with the high ability groups, there was a trend toward higher achievement in favor of the regular class children.

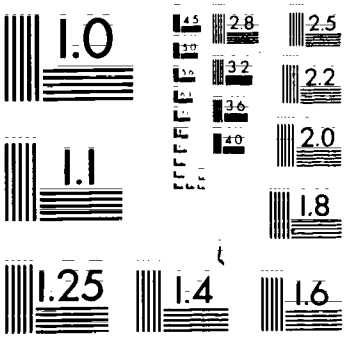
Social and personal adjustment were evaluated in three ways: mothers' evaluations of their children's performance, neighborhood sociogram, and studies of divergent thinking, risk taking, and anxiety. The expectation that the special class children would exhibit more favorable adjustment was supported.

In 1969, Goldstein, Mischio, and Minskoff attempted to replicate the Illinois study in a less controlled milieu. The purpose of the attempt was the establishment of external validity (Campbell & Stanley, 1966). "Apart from the spottiness of the results, the most serious shortcoming of the Illinois study is found in the fact that it cannot be generalized in thought or deed to existing special class programs" (Goldstein et al., 1969, p. 5). Specifically, the random assignment of children to special education classes created an uncommonly

homogeneous sample, the teachers had been trained in a single teacher training program and had available a unique set of resources.

Fifty teachers (38 experimental and 12 comparison) and 335 primary-level mentally retarded children participated in the study. The purpose of the research was to examine the skill of teachers in using an experimental curriculum and method, to measure the impact of the curriculum and method upon the students, and to investigate the relationship of background characteristics to effective use of the curriculum and methods. All teachers were given the Illinois Curriculum Guide; experimental teachers were trained in workshops and inservice programs on the use of the guide and the inductive teaching method. The project lasted for three years and employed a variety of quantitative and qualitative research procedures. The children were tested, for example, with standardized tests of academic achievement, intelligence and divergent thinking. In addition, researchers observed teachers, conducted interviews and recorded lessons.

Data are reported on 24 teachers (17 experimental and 7 comparison) and 148 children. Goldstein et al. (1969) found qualified support for the expectation that experimental teachers would use the curriculum and method more than comparison, strong support for the relationship between use of the curriculum and use of the method, no support for the expected relationship between background characteristics of teachers and their implementation of the method and curriculum. In terms of the children's performance on criterion measures, the experimental children were significantly superior to comparison children on tests of divergent thinking developed by Torrence and colleagues.



Other studies have examined methods of teaching. These studies will be reviewed briefly since both the SLC and IE incorporate rather specific instructional procedures into the curricular design. Petry (1973) compared the effects of special education placement, regular class placement and one-to-one tutoring upon the reading and math achievement of 266 neurologically handicapped children. The criterion measure was the Wide Range Achievement Test (WRAT); no significant differences were detected after intervention.

Romeo (1975) also used the WRAT to determine the effectiveness of three intervention strategies with mildly handicapped children. The three strategies approaches were directive teaching or, the programmed presentation of math problems, directive teaching with data retrieval, programmed presentation with emphasis upon orderly recall of critical information, and traditional strategies. Intervention lasted 10 weeks. The expectation that children taught with directive teaching plus data retrieval would exhibit superior performance was not supported.

DeBoer (1974) compared traditional with "computer-managed" programs of instruction. In traditional programming, the selection and sequencing of instructional tasks are determined by the teacher; with computer managed programs, the teacher enters certain information into a computer, and it generates an instructional sequence. Seventy-one learning disabled children were taught with traditional instruction and 48 received computer managed programs. The children's academic achievement was assessed before and after intervention with the PIAT. There was no difference in performance.

Fafard (1976) studied the relationship between verbal instructions and the performance of learning disabled children on word problems in

math. Three types of instructions were used: structured instructions, guided questions, no specific instructions. In addition, two types of word problems were used. One type had only relevant information; the other had extraneous information. The dependent variable was the student's performance on 20 verbal arithmetic problems; performance was evaluated along four dimensions: time required to solve the problems, number of correct solutions, number of misoperations and number of computational errors. Main effects were found for problems with extraneous information along the dimensions of time for solution and number of misoperations. There was also a significant interaction between type of instructions and problems with structured instructions yielding more effective performance on problems with extraneous information.

Quinn (1977) examined the effectiveness of operant techniques as compared to traditional methods in increasing academic achievement and social competence. Thirty preadolescent children participated in the study with half being taught with each procedure. There was no difference in the academic performance; Quinn indicated statistically significant improvement in social competence but cited no information regarding how it was measured.

Research has been conducted with Instrumental Enrichment in Israel and North America. In the Israeli project (Feuerstein, Rand, Hoffman, Hoffman, & Miller, 1979) 114 subjects, half of whom had IE for two years and half of whom were exposed to the traditional curriculum were tested. Five areas were examined: general intellectual functioning, specific cognitive functioning, basic scholastic skill, classroom interaction and self-concept. Using a pretest-posttest battery of IQ tests, Feuerstein et al. found "substantial support from the findings pertaining

to general and to specific intellectual functions, partial support from measures of scholastic skill and classroom interactions and no support from measures of self-concept" (p. 548).

Haywood and Arbitman-Smith (1981) found significant main effects for treatment and trials on Lorge Thorndike Intelligence Tests (Nonverbal) in a pilot testing of the IE program. Data from the second year of intervention indicated certain groups of experimental children outperformed comparison children on subtests of PMA and achieved significantly higher grade equivalent scores on the Key Math Diagnostic Arithmetic Test. In addition, children classified educable mentally retarded showed significantly superior increases in performance on the General Information Subtest of the Peabody Individual Achievement Test and the Piers-Harris Children's Self Concept Scale.

Children in the Phoenix sample of the North American Project showed significantly superior gains in performance on the Standard Progressive Matrices and the Lorge Thorndike Nonverbal Intelligence Test. Statistically significant differences were also detected between experimental and control children on the Picture Motivation Scale.

Rothaizer (1981) studied the effectiveness of IE in "demonstrating the significant cognitive remediation is possible" (p. 18) with juvenile offenders. Forty students participated in a 2-week intervention with IE; subjects receiving IE exhibited significantly superior performance on the Lorge-Thorndike Nonverbal Intelligence Test, selected items from the Standard Progressive Matrices, and items from the Learning Potential Assessment Device.

Research Expectations

On the basis of theoretical literature regarding the development of the SLC (Goldstein, 1957; Goldstein & Goldstein, 1980; Goldstein, Note 1, Note 2, Note 3, Note 5) and IE (Feuerstein, 1979, 1980, Note 10, Note 11) presented in Chapter I, theoretical positions toward evaluation research (Campbell & Stanley, 1966; Cook & Campbell, 1979; Cronbach, 1963; Scriven, 1967; Stake, 1967a, 1967b) and empirical literature dealing with curricular evaluation, quantitative and qualitative research expectations were proposed. They are presented below.

Quantitative Research Expectations

I. Treatment I (SLC)

A. Students in this group are expected to perform significantly better than students in Treatment III (Comparison) on all measures.

B. Students in this group are expected to perform significantly better than students in Treatment II (IE) on the Test of Social Inference and Social Knowledge Assessment.

II. Treatment II (IE)

A. Students in this group are expected to perform significantly better than students in Treatment II (Comparison) on all measures.

B. Students in this group are expected to perform significantly better than students in Treatment I (SLC) on the Standard Progressive Matrices.

Qualitative Research Expectations

I. Children who have been taught with the SLC should be able to "think critically." A person who thinks critically should be able to:

A. Recognize the existence of a problem

B. Organize information that relates to the task

C. Solve problems

1. Produce several alternative solutions

2. Identify potential obstacles

3. Specify ways to cope with or avoid obstacles

II. Children who have been taught with the SLC is able to "act independently." This means that the child is able to function in a variety of settings without disrupting the harmony of the environment.

III. Children who have been taught for a full year with the SLC should be able to use subject matter knowledge and skills to solve problems.

Specific skills are:

A. Understanding of why one reads

B. Ability to solve word problems in mathematics

C. Ability to apply processes and skills to daily living.

IV. Children who have been taught with the SLC will have more positive attitudes toward school.

CHAPTER III

QUANTITATIVE AND QUALITATIVE METHOD

The purpose of this chapter is to describe the two methodologies used in this study. The first section of the chapter discusses each aspect of the quantitative method from the experimental design to threats to validity. The second section addresses procedures used to collect qualitative data.

Quantitative Design

The experimental design used in the study was a modification of the Non-Equivalent Control Group Design (Campbell & Stanley, 1966), a quasi-experimental design chosen because random assignment of the subjects was not possible. The design is represented graphically in Figure 1. Treatment Group 1, the subjects receiving instruction with the SLC, was composed of 65 children in six classes. Treatment Group 2, subjects receiving IE was made up of 36 children in three classes. The original design included six classes of children receiving IE; a variety of factors operated to reduce the number of classes comparable to the six SLC groups to three. Treatment Group 3 consisted of 62 children in six classes receiving traditional special education programs. The specific nature of these programs is presented in Appendix B.

Selection of Teachers

Participating teachers were selected through a multi-stage process. All teachers of Noncategorical Comprehensive Development classes (NCD)

A= Treatments
B= Ability
C= Time of measure

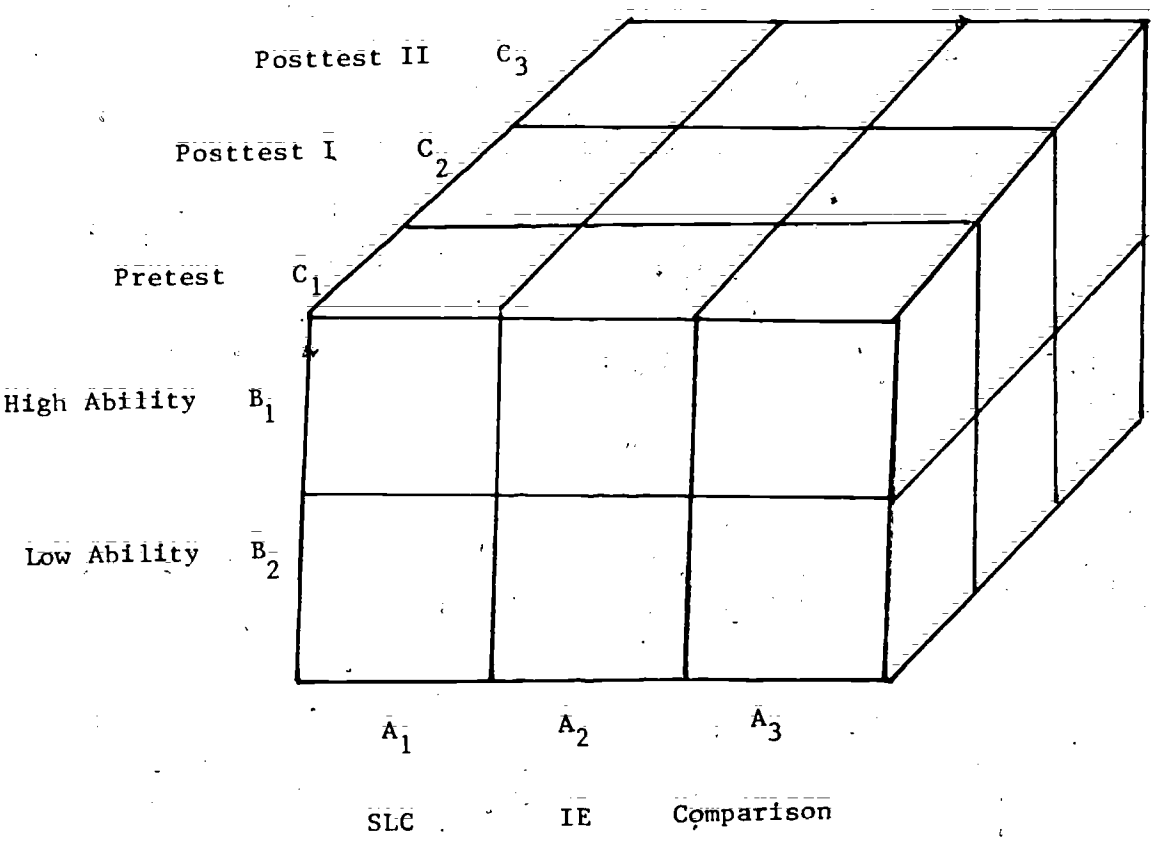


Figure 1. Graphic depiction of experimental design.

in the Metropolitan Nashville-Davidson County Public School System were sceeened so that teachers working with children above the chronological age (CA) 11 could be identified. Feuerstein (1979) designates this age as the youngest for which IE is appropriate. Noncategorical Comprehensive Development classes at the elementary level operate as predominantly self-contained programs for mildly handicapped children. Children in these classes may be officially classified as mentally retarded, learning disabled, behavior disordered or exhibiting learning problems.

From the teachers so identified, a representative of the Research and Evaluation Department of the school system generated a list of teachers who had demonstrated competence and were receptive to innovation. Teachers were then invited to participate in training workshops for IE or the SLC. The initial IE workshop was held in January 1980, under the direction of Feuerstein and his colleagues from the Israeli IE project. Six NCD teachers were among the participants at the workshop. They used IE materials from two instruments, Organization of Dots, I, and Orientation in Space with support during the spring of 1980. These teachers also attended a summer workshop conducted by the North American IE Project Staff, and a winter workshop in January 1981, led by Feuerstein.

Six other NCD teachers participated in the SLC workshop in August 1980. The training sessions were conducted by H. Goldstein and M. Goldstein. The SLC teachers began using the materials at the beginning of the 1980 school year. Six comparison teachers were recruited from the list generated by the Research and Evaluation personnel.

Selection of Subjects

Subjects in the study were students in NCD classes in the Metropolitan Nashville School System. All students assigned to the classes of participating teachers were considered potential subjects. Students were included in the study upon receipt of parental permission letters. A total of 163 students participated in the study. Twenty students (12%) were lost through attrition; the final sample, therefore, included 143 students. Characteristics of the subjects are presented in Table 7.

TABLE 7

CHARACTERISTICS OF THE CHILDREN

	SLC	IE	C
High Ability (IQ≥76)	28	21	33
Low Ability (IQ≤75)	27	12	22
Male	35	25	38
Female	20	8	17
Black	21	9	21
White	34	24	34
Educable Mentally Retarded	18	5	19
Learning Disabled	30	23	30
Learning Problem	7	5	6

Independent Variables

The independent variables in the study were Instrumental Enrichment (Feuerstein, 1980) and the Social Learning Curriculum (1974, 1975, in press). These programs have been described in detail in Chapter I. During the course of this project, IE teachers taught four instruments: Organization of Dots, I, Orientation in Space, Analytical Perception, and Comparisons.

The SLC teachers used materials from phases 11-16 of the SLC with one teacher also using prepublication field-test material from the Problem-Oriented Social-Vocational Adaptation Program (POSVAP). These teachers selected particular phases in accordance with their perceptions of the students' needs. The amount of direct instructional time devoted to the materials averaged four hours per week for both interventions, i.e., the teachers' instructional schedules allotted one period a day, five days a week to IE or the SLC. During this period of time, the teachers worked directly from the phase books of the SLC or the teachers' guides of the IE program.

Most of the SLC teachers used the content and procedures of the SLC "indirectly" for additional instructional time. The amount of indirect usage varied as a function of the content of the phases which were adopted, the content of other academic material, particularly language arts and reading, the extent of internalization of the Logical Inductive Method (LIM), and the overall school schedule.

This usage of the SLC did not correspond to developers' intentions that it be used as a core curriculum. Work on most of the comprehensive curricular programs available in special education, e.g., Project MATH (Cawley, Goodstein, Fitzmaurice, Lepore, Sedlak, & Althaus, 1976),

Project MORE (Bieberly, Lent, Kellitz, Foster, & McLean, 1974) and the SLC was begun when the model service delivery system in special education was the self-contained class (Goodstein, Note 15). In terms of this study, this usage served to equate instructional time with the two interventions, i.e., children taught with the SLC received approximately the same amount of direct instruction with SLC materials as children taught with IE.

Dependent Variables and Instrumentation

Dependent variables of evaluation research must reflect the goals of the program(s) being evaluated. The goals of both IE and the SLC have been presented. In order to deal with the long-range nature of the goals and the limited period of intervention, two types of dependent variables were studied: first-order and second-order. First-order dependent variables were directly related to the independent variables. Theoretically, the first-order dependent variable served as a link between the independent variable and the second-order dependent variable. The clearest example in this study is the relationship between IE, the first-order dependent variable of intellectual functioning, and the second-order dependent variable, academic achievement.

First-Order Dependent Variables

General Intellectual Functioning and Cognitive Modifiability

Both IE and the SLC emphasize the development of problem-solving abilities which are grounded in cognitive processes. The modification of cognitive structures is a basic goal of IE and an implicit objective of the SLC, i.e., improvement intellectual functioning would affect the individual's ability to think critically.

General intellectual functioning was assessed with Standard Progressive Matrices (SPM) (Raven, 1960). Standard Progressive Matrices is a normative scale which assesses an individual's "capacity for observation and clear thinking" (Raven, Court, & Raven, 1976, p. G4). The scale is divided into five sets of 12 problems. Each problem consists of an incomplete geometric figure or an incomplete set of geometric figures. The subject is asked to study the problem, identify the theme which governs the relationship of the parts of the figure or the figures and solve the problem by selecting the correct piece or figure. Stability reliability is .87 for subjects over chronological age 13.

Social Inference

A major goal of the SLC is the development of the ability to infer correctly, particularly in social contexts. A specific impairment in cognitive functioning according to the IE theory (Feuerstein, 1980) is impaired inferential thinking.

The instrument selected for measuring this variable was the Test of Social Inference (TSI) (Edmonson, Leland, deJung, & Leach, 1974). The TSI consists of 30 pictures; the child is asked to examine a picture and make inferences from it regarding the nature of the social situation. The TSI was considered particularly appropriate for this study because inference is a basic step in inductive problem solving and because the test has been normed for retarded and nonretarded persons. Coefficient of test-retest reliability with mentally retarded subjects is .90. In addition, the TSI was influential in the development of the Test of the Hierarchy of Inductive Knowledge (THINK) (Smith & Greenberg, Note 11).

Problem Solving

The ultimate goal of the SLC is to increase efficiency of problem-solving skills. Feuerstein (1979, 1980) addresses the need to solve problems in each phase of the mental act: input, elaboration, and output. The primary test used to assess problem-solving abilities of the children was Matching Familiar Figures Test (MFFT) (Kagan, Rosman, Day, Albert, & Phillips, 1964).

The MFFT was designed to assess the extent of reflectivity or impulsivity exhibited by students. It is a nonverbal test which was used as an indicator of cognitive style. The child is presented with a test booklet which contains a stimulus picture at the top and six similar pictures below. The task is to match the stimulus exactly. Messer (1976) reports range of reliability for response time of the MFFT .58-.96 and for error rate .34-.80.

In addition, the Test of the Hierarchy of Social Knowledge (THINK) (Smith & Greenberg, Note 16) was used in a pilot fashion with some of the subjects. The THINK specifically evaluates the subject's ability to apply the steps in inductive problem solving in social situations. It consists of sets of pictures which share a theme. The test may be regarded as an extension and refinement of the TSI since it assesses the child's ability to identify the nature of the problem, to propose and evaluate possible solutions and to combine the optimal strategies into a generalization or rule (Smith & Greenberg, in press).

Social Knowledge

The content of the SLC focuses specifically upon social information. Social knowledge was proposed, therefore, as a first-order dependent

variable. A careful examination of available instruments revealed no normative tests of social knowledge which would be appropriate for this study. The research proposal had called for criterion-referenced assessment based upon the "Assessment of Phase Knowledge Charts" of the SLC. The proposal also specified social knowledge as a dependent variable for the SLC treatment groups only.

Prior to the initiation of the study, it was decided that data on this variable should be collected for all children, SLC, IE, and comparison. At the time of pretesting, an attempt was made to assess in a criterion-referenced fashion, the social knowledge of the children receiving the SLC. Lack of satisfaction with the information acquired led to the development of a general social knowledge inventory. The survey consisted of 25 questions drawn from the "Assessment of Phase Knowledge Charts" in the six phases of the SLC used in the study (no questions from the POSVAP phases were included). The inventory and procedures used for administration and scoring are included in Appendix C.

Second-Order Dependent Variables

Academic Achievement

The increase in efficiency and proficiency of cognitive functioning is logically correlated with expected improvement in academic performance. This is especially so with a school-based intervention. The Peabody Individual Achievement Test (PIAT) (Dunn & Markwardt, 1970) provides a measure of individual achievement. The PIAT is composed of five subtests: reading recognition, reading comprehension, arithmetic, spelling, and general information. Normative use of the PIAT was

inappropriate since there was no exceptional children in the norming sample. Raw scores can be compared and evaluated, however.

The original intention was to use all the subtests of the PIAT. In order to reduce the amount of testing time required of the children and to prevent the duplication of testing efforts, only the General Information Subtest was used. The school system administered Individual Criterion-Referenced Tests in Reading and Math (Educational Progress Corporation, 1978) to all children in the NCD classes. Reliability coefficient is .80.

Personality-Motivation Factors

Intuitively, the way a child feels about the schooling experience would be expected to affect his/her conception of self. If educational programs are motivating and meaningful, schooling should be a more pleasant and fulfilling experience.

The personality-motivation factor examined in this study was self-concept. The instrument used was the Piers-Harris Children's Self Concept Scale (PH) (Piers, 1969). The PH has been used with mildly handicapped children to examine the effects upon self-concept of partial reintegration into regular programs and the relationship of academic achievement and self-concept (Rogers, Smith, & Coleman, 1978; Strang, Smith, & Rogers, 1978). The PH yields a general or composite self-concept and six cluster scores, reflecting subdivisions of self-concept: Behavior, Intellectual and School Status, Physical Appearance and Attributes, Anxiety, Popularity, and Happiness and Satisfaction. Full scale reliability coefficient is .77.

Procedure

Treatment

Five of the six SLC teachers began using the materials at the beginning of the school year. Each teacher selected the phase of the curriculum which he/she believed to be most appropriate. The sixth teacher elected to begin formal use of the SLC at the beginning of the second grading period, the first week in October. She chose to do this because she felt she needed the opportunity to "practice" teaching inductively, and she believed she would be more comfortable in doing this with material which she had previously developed.

The three IE teachers began using the materials after pretesting had been conducted by the primary IE project. Their initiation coincided with that of the sixth SLC teacher. Although five of the six SLC teachers began using the materials earlier than the IE teachers, the IE teachers had used the materials in a supported practicum in the spring. Comparison of the pretest scores of children who began the intervention in September with those who began in October revealed no significant differences.

A concerted effort was made to support the SLC teachers in their attempts to implement the intervention. The activities of the training workshop were audiotaped and transcribed. From the transcription, a "guide" (Hall, Note 17) was developed and distributed to teachers. In the early stages of the project, I visited the teachers at least once a week; in addition, weekly contact by visit or phone continued throughout the study. Current papers by Goldstein were copied and distributed as were portions of Curriculum Research and Development Center

working papers which seemed applicable to the implementation of the SLC. Newsletter-type memoranda were sent to teachers throughout the school year. These dealt with the status of the project, testing schedules, testing results, and always appreciation for the efforts of the teachers. Copies of the memoranda were sent to administrative personnel at the central office and school level.

In addition, SLC teachers met several times during the year on an informal basis to discuss their experiences in using the program. Participation in these meetings was voluntary; meeting places and times were determined by the teachers. Personnel from the Department of Special Education and Research and Evaluation Department of the school system were invited to these meetings. Consultation to the teachers using IE was provided by the staff of the IE project.

Testing Procedures

Six different tests were administered to the children during the course of the project. The design was a pretest, posttest, posttest. Of the six instruments used, two more administered three times and four were given twice. Table 8 provides a tabular presentation of the tests administered over the course of the study.

All tests were administered individually. All tests except the Test of the Hierarchy of Inductive Knowledge (THINK) were administered by me or by the research assistant of the SLC/IE project. Twenty-one students were tested by Greenberg as part of a pilot reliability study for the revised form of the THINK (Smith & Greenberg, 1981). The results of this assessment are reported in Chapter V and Appendix D. Due to the somewhat subjective format of the Test of Social Inference (TSI), it was administered only by me.

TABLE 8

TEST ADMINISTRATION SCHEDULE

Dependent Variable	Instrument	Administration		
		September 1980	January 1980	April 1981
General intellectual functioning	Standard Progressive Matrices	X		X
Social inference	Test of Social Inference	X		X
Problem solving	Matching Familiar Figures Test		X	X
Social knowledge	Social Knowledge Assessment		X	X
Academic achievement	General information subtest, Peabody Individual Achievement Test	X	X	X
Self-concept	Piers-Harris Children's Self-concept Scale	X	X	X

Testing was conducted in unoccupied classrooms or workrooms. Testing time per occasion did not exceed 1 hour and was usually 35-40 minutes. No child was removed from a favored classtime activity for testing purposes. Researchers spoke with teachers on each testing occasion in an effort to identify any factors which might invalidate test results. If such factors existed, children were tested at a later date.

Threats to Validity

In discussing experimental design, particularly as it relates to educational research, Campbell and Stanley (1966) proposed that researchers be especially concerned with two types of validity: internal and external. "Internal validity is the basic minimum without which any experiment in uninterpretable. . . . External validity asks the questions of generalizability" (p. 6).

In 1969, Campbell expanded discussion of appropriate application of experimental design in evaluating "social reform" programs and addressed a particularly dangerous threat to the interpretation of data collected with the quasi-experimental design: instability. Cook and Campbell (1979) expanded the concept of instability into a major category of "threats to valid inference making" (p. 37) which they call statistical conclusion validity.

The relationship between internal and external validity is one of exchange, i.e., a research study cannot have perfect internal and external validity. With a quasi-experimental design the task becomes a cost-benefit analysis of the bartering of the threats. In the following section, threats to internal, external, and statistical

conclusion validity, and the procedures adopted to control the threats are discussed and evaluated.

Internal Validity

History. Performance on the dependent variable may be affected by events other than the introduction of the independent variable. These external events constitute the threat to validity known as history. An efficient way to protect against this threat is to assign randomly subjects to treatment groups. Although the subjects were the units of analysis in the study, concern had to be focused on the assignment of teachers as well as that of students.

The research proposal called for the random assignment of the 18 participating teachers to one of the three treatment groups. Random assignment was impossible for several reasons. The first and most difficult obstacle was temporal; in order to assign randomly the 18 teachers to one of three treatment conditions, researchers would have had to obtain a commitment from the teachers prior to the initial IE workshop. This was nine months before the project was to begin and six months before notification of funding. A second major barrier was the fact that the Metropolitan Nashville-Davidson County School System was involved in litigation regarding the implementation of court-ordered desegregation. A variety of plans had been proposed for resolving the problems. Since each plan specified a different manner of service delivery, it was impossible for administrators to guarantee that teachers would be working with similar groups of children at the beginning of the next school year.

Given this, a calculated risk was taken that teachers who were invited to take part in the IE workshop would wish to participate in this study and would be serving children in an NCD classroom. Teachers who were unable to attend the IE workshop in January but who expressed interest were invited to attend the SLC workshop.

Of the six SLC teachers, all were assigned to appropriate classes. Three IE teachers were lost as a result of leaving the system, school assignments which prohibited inclusion, or the decision not to use the material. The six comparison teachers were selected from the list generated by Research and Evaluation. These teachers were unable for various reasons to attend either workshop but agreed to participate as comparison teachers.

The selection of subjects approximated randomization. Procedures will be discussed in detail under the threat of Selection. Events which occurred during the time span of the study seemed to have equal impact upon all participating teachers and children.

The past histories of individual children were considered only in relation to the current interventions. Data from one child were eliminated because she had received 16 months' intervention with IE prior to this study. Four other children in the IE treatment groups had received some exposure to the intervention during the practicum experience of the teachers. In addition, one of the SLC subjects had been taught with the curriculum in a practicum experience and one of the comparison children had been in an IE class previously. Since the experience of the subjects with the interventions was brief and since comparison of their scores with those of randomly selected classmates revealed no

significant differences, scores from these children were included in the analysis.

Maturation. The second threat to internal validity refers to "processes within the respondents operating as a function of the passage of time per se" (Campbell & Stanley, 1966, p. 5). The age of the subjects (Range = 11-17; $\bar{X}$ = 12 years, 7 months) mitigates any effects from maturation alone. In addition, the dependent variables are not subject to great alteration as a result of maturation in a 9-month period.

Testing. This threat to internal validity refers to the reactive nature of the tests, or the impact of having taken the test previously upon posttest performance. The six basic instruments used in the study are relatively nonreactive in the sense that they were not, for most of the subjects, obviously related to the interventions. The two exceptions were SPM and the TSI. Many of the IE children commented about the similarity between some of their IE lessons and the tasks of the Raven's. There seemed to be no consistent relationship between the recognition of the relationship and performance, however. In terms of the TSI, the teachers saw the similarities between the tasks of the test and the activities of the SLC. The dangers to the validity of stressing this similarity and in effect, "teaching to test" were discussed. The cooperation of the teachers was sought in reducing the threat. Observational records and teacher logs indicate that teachers understood the dangers and did not teach to the test.

Reactivity was also reduced by the fact that the study ran throughout the school year. As a result, the presence of the research staff

for observation, consultation, and/or testing became an integral between testings ranged from two to six months. This operated to reduce the probability of reactivity.

Instrumentation. The threat of instrumentation refers to variation in the administration and scoring of tests. All tests reported in this study were conducted by me or by the research assistant. The TSI was administered and scored only by me. All testing was done individually; procedures for administration specified in the test manuals were adopted.

Certain additional procedures were determined by me to be critical to the validity of the data. The Piers-Harris Children's Self-Concept Scale (PH) (Piers, 1969), for example, presents 80 statements in a yes-no format. If a child showed signs of failure to attend to the questions either by contradicting himself/herself repeatedly or by responding perseveratively with strings of yeses or no's, examiners marked questionable responses and asked at the end of the test for verification. Verification of conceptual comprehension of the questions was also sought on the PH. Two questions had to be altered for use with childen of this age. They were, "I am popular with boys" and "I am popular with girls." These were asked as "I have many friends who are boys or girls." In addition, "I have lots of pep" was read, "I have lots of energy."

With the Social Knowledge Survey, we made a concerted effort to communicate with the children. I determined administration procedures and these were carefully modeled by the research assistant. The same methods were used with all children. I scored all SK Survey Forms. All tests were handscored from the protocols or score sheets after administration.

Statistical regression. Regression is a threat to validity when students are selected on the basis of extreme scores. Regression can be controlled by random assignment. Although the selection of students was not random, students were selected as a function of being assigned to a teacher. Neither researchers nor participating teachers had any control over student assignments. All students had been individually evaluated and staffed into the NCD classes. In the experimental design, children were separated into low and high ability. If regression were a threat, it would be expected to occur among the most extreme children, those of lowest ability. These children appear in all three treatment groups constituting 36% of the IE subjects, 40% of the comparison subjects, and 49% of the SLC students.

Selection. The sixth threat to internal validity deals with "biases resulting in differential selection of respondents for the comparison groups" (Campbell & Stanley, 1966, p. 5). The selection of subjects approximated randomization. Students became potential subjects as a result of being assigned to the class of a participating teacher. Assignment was determined by the specification on the child's individual education program and area of residence.

The critical threat to selection in this study was not that of the students but the teachers of the comparison groups. All teachers were selected from the list generated by the Department of Research and Evaluation of the school system in an effort to insure comparability of competence and enthusiasm across the participating teachers.

Mortality. Mortality refers to differential loss of subjects. Twenty subjects (12%) were lost from the study. Of these 10 were SLC students, 3 were IE, and 7 were Comparison. This was an 18% loss for

the SLC treatment, an 8% loss for the IE group, and a 13% loss for the comparison children. In terms of ability, 6 of the 10 SLC children, 1 of the 4 IE subjects, and 5 of the 7 C students had IQs above 75. The pretest data for all subjects were analyzed. The children who dropped out were not significantly different from those who remained. In addition, reasons for withdrawal were documented and are presented in Appendix E.

External Validity

Experimentally accessible versus target population. The extent to which the results of a study can be generalized depend in part upon the similarity of the sample to the population. The most efficient means of dealing with this threat to validity is by randomly selecting from a large subject pool. The procedure for the selection of subjects was an approximation of a random process since each NCD class is reconstituted annually, i.e., most of the participating teachers had not had the students in the previous years.

Although the loss of the three IE classes reduced the size of the sample, complete data sets were available on 143 children. The sample was extremely heterogeneous and thus representative of special education populations in metropolitan areas. Table 7 presents a numerical breakdown of children by characteristics important for generalization (see page 91).

Interaction of treatment effects and subject characteristics. A major threat to external validity and one which is particularly significant to research in special education is the possible interaction of treatment effects with subject characteristics. The danger in ignoring

this possibility is the conclusion that a treatment will be equally effective or ineffective for all levels of a subject characteristic. On the basis of previous research (Budoff & Gottlieb, 1976; Goldstein et al., 1965) the experimental design included two levels of ability since this was considered to be a critical characteristic for children served in special education programs.

Multiple treatment interferences. If two or more treatments are occurring simultaneously, it may be difficult to attribute an effect to either treatment or to the interaction of the two. Although IE and the SLC were the only instructional interventions, it is possible that a second treatment was inadvertantly introduced through my activities.

I conducted structured interviews with all participating teachers in order to determine the nature of curriculur programming; each class, IE and C in addition to the SLC was observed at least once. In addition, newsletter type memoranda were sent to all participating teachers. At the request of teachers, mean scores from each class were included after each testing occasion. The classes were not identified on the sheets; the scores of a given teacher's class were specified for him/her. The newsletters may have provided an unintended and yet potent treatment effect. My relationship with the teachers became one of collegiality; through the memoranda, I provided data within and between classes. Teachers had the scores for their respective students and the mean scores of 14 other classes. From the newsletters, they could evaluate progress in a criterion-referenced as well as "normative" fashion. The memoranda were carefully examined by most of

the teachers. In several cases, the sheets became the focal point of discussion among teachers and principals.

Other than the newsletter incentive, there were no other treatments. Data from the structured interview (see Appendix B) indicate that the experimental classes were using the same types of materials for reading and math as the comparison groups.

Interaction of history and treatment effects. Historical events which occur during the implementation of an intervention might operate to increase or decrease the effectiveness of this treatment. This is particularly the case in studies of short-duration or with extremely unusual events. No major historical events which might affect the performance of the subjects were noted; in addition, the study ran an entire academic year.

Interaction of time of measurement and treatment effects. This threat to validity is concerned with the possibility that measurements taken at a particular time during the implementation might vary considerably as a function of the interaction of time of treatment and measurement. The use of multiple measurement occasions helped to control this threat.

Pretest sensitization. The danger of this threat is that the administration of the pretest may sensitize the subjects to the impact of the treatment. In this study, several factors combined to reduce the potential impact of pretest sensitization. First, an entire battery of tests was given on three different occasions. Second, the tests were not extremely reactive nor clearly related to the contents of the interventions. Finally, the nature of the sample, i.e., mildly handicapped children, reduced the possibility that there would be an increased treatment reaction because of the pretest.

Hawthorne effect. The Hawthorne effect has been used to describe change in dependent variables simply as a function of participating in a research project. The characteristics of the sample, the length of the study, and the integration of the treatment into the schooling experience mitigated this threat. This was particularly so for the SLC; most of the SLC teachers referred to the time they spent with the curriculum as "science, social studies, or health."

Novelty and disruption effect. It is possible that the introduction of an innovation may cause change by virtue of novelty alone. The length of the study and the fact that the interventions became an integral part of the school day helped to control the threat.

Experimenter bias. Experimenter bias can occur at many points within a study. The most dangerous and elusive forms of bias are the unintentional modifications of a subject's performance through verbal or nonverbal cues (Huck, Cormier, & Bounds, 1974). Every effort was made in this study to control any threat of experimenter bias. Whenever possible, the research assistant and I tested together and each monitored the behavior of the other. Possible ways in which bias could occur were discussed with the intention of identifying controls.

Statistical Conclusion Validity

Field research conducted with a quasi-experimental design is particularly vulnerable to a Type II error, i.e., accepting the null hypothesis of no difference when it should be rejected. Cook and Campbell (1979) address the pragmatic results of such action.

> While we cannot prove the null hypothesis, in many practical contexts we have to make decisions and act as though the null hypothesis were true. This is especially the case in applied research where decisions have to be based on imperfect knowledge

> which only suggests that a treatment has had no detectable effect. The issue then becomes: By what standards should one estimate the confidence that can be placed in "accepting" the null hypothesis, particularly if a decision has to be based on the results of a single experiment? (p. 45)

Low statistical power. The power of a statistical analysis is a function of variance and sample size. The validity of conclusions from the data depend in large measure upon "how much power one has to detect an effect" (Cook & Campbell, 1979, p. 39).

A power analysis provides an indication of the amount of confidence one can place in the validity of any statistical conclusion. The more power an analysis has, the more confident the researcher can be of avoiding a Type II error. Power analyses were conducted and appear in Table 9.

Violated assumptions of statistical tests. Data analysis can be meaningless if the assumptions underlying the analysis are violated. This is particularly so with critical assumptions.

Assumptions for the analysis of covariance (ANCOVA) are those of the analysis of variance, normality of distribution and homogeneity of variance, plus linearity and common slope. Homogeneity of variance was tested with Hartley's F-Max test; common-slope was tested by analysis of the homogeneity of within-class regression. The assumption of linearity was met by using the pretest as the covariate. All results are provided in tabular form in Appendix A.

Fishing and error rate problem. The more analyses one conducts, the higher is the probability of obtaining significant differences between groups as a result of chance alone. This threat can be controlled by conceptually justifying each analysis. In addition the level of significance can be adjusted to take into consideration multiple analyses.

TABLE 9

POWER ANALYSIS

δ	Power	δ	Power
.97	.25	2.17	.70
1.64	.50	2.32	.75
1.90	.60	2.49	.80
2.08	.67	2.68	.85

Instrument	δ	Power
Standard Progressive Matrices	1.29	.33
Test of Social Inference	1.62	.41
Social Knowledge Assessment	1.32	.34
Matching Familiar Figures Test	.51	--
General Information, PIAT	2.49	.80
Piers-Harris Children's Self-Concept Scale	1.34	.34

Source: Welkowitz, J., Ewen, R. B., & Cohen, J. Introductory statistics for the behavioral sciences. New York: Academic Press, 1976.

Reliability of measures. Confidence in the validity of change in a dependent variable is due in part to the stability (test-retest) reliability of the instrument which is used to assess it. Salvia and Ysseldyke (1978) recommend a reliability coefficient of .90 for individual tests used to make placement decisions; for administrative purposes, they suggest a minimum of .60. The reliability coefficiencts

are reported in the description of the instruments. While the coefficients are lower than one might desire, more reliable tests which met the conceptual needs of the study were not available.

Reliability of treatment implementation. Lack of standardization of treatment implementation "will inflate error variance and decrease the chance of obtaining true differences" (Cook & Campbell, 1979, p. 43). This is a particular problem for special education researchers. The experimental design was nested, i.e., students receiving instruction from the same teacher were to be compared with students being taught by other teachers within and between treatments.

Use of a nested experimental design in combination with careful monitoring of teacher training and use of the materials would have allowed substantial control over the threat. In order to conduct an analysis of variance within a nested design, the two factors, treatment and ability had to be fully crossed. The assignment of students to classes precluded such an analysis. Some of the 15 classes had approximately equal numbers of high and low ability children; others had predominantly high or low ability students. The distribution of ability (determined on the basis of IQ scores) within the classes was a function of chance rather than of any policy or deliberate grouping action.

The data were analyzed by collapsing them across classes and ability levels within treatments. Every effort was made to monitor the implementation of the experimental treatments. The nature of the programs, particularly the SLC, requires teachers to use a flexible and dynamic approach. In addition, each program requires preparation by the teachers. The variation among both SLC and IE teachers in planning time was, by their admission, great.

Although the teachers were conscientious in attempting to implement the programs, the quality of their implementation varied greatly. The variation was between rather than within teachers. Many different techniques were tried in an effort to establish reliability of implementation. Some techniques were more successful than others though none eliminated the problem. The impact of this threat will be discussed further in Chapter VI on interpretation of data.

Random irrelevancies in the experimental setting. Factors other than the independent variable may affect performance on the dependent variables. This threat is very difficult to control; some reduction can, however, occur, if the treatment groups are as similar as possible. All classes in the study were NCD classes, housed within regular schools. Students are assigned to particular schools on the basis of a zoning procedure. Most schools have an NCD class so that mildly handicapped children can attend the same school as their nonhandicapped neighborhood peers. As a result, the population of a particular school reflects that of a given residential area. Residential areas may be characterized in terms of socioeconomic status (SES). The process by which teachers were selected did not control for the SES characteristics of the children served. Specific characteristics of the distribution of school settings are presented in Table 10. With regard to SES, only two of the six SLC classes and two of the three IE classes served middle class children as opposed to four of the six comparison groups.

Random heterogeneity of respondents. Subjects can differ in factors which affect performance on the dependent variable. Cook and

TABLE 10

DISTRIBUTION OF TREATMENT CLASSES BY
RACE AND SOCIOECONOMIC STATUS

Racial Distribution	Low	Middle	Mixed
	Socioeconomic Status		
Predominantly Black	SLC-1 IE-1 C-2	C-1	
Predominantly White		SLC-1 IE-2 C-3	
Mixed	SLC-2		SLC-2

Distribution of Treatment Classes by Type of School			
Elementary (K-6)	Fifth-Sixth	Middle(5-8)	Junior High(7-9)
			SLC-1 IE-1 C-2
		SLC-2	
SLC-1 IE-1			
	SLC-2 IE-1 C-4		

and Campbell (1979) refer to these factors as "suppressor variables" (p. 45). One of the most difficult suppressor variables to overcome is low SES. In addition to the differences in SES which have been discussed, there were differences in the distribution of the ability.

Had the data been analyzed with ability as a blocking factor, differences, particularly in the low ability children, would have been

totally obscured. Of the SLC low ability (IQ≤75), 29% (7) had IQs between 50-59 compared to 14% (2) of the C low-ability children and 10% (1) of the IE low ability. Distributions of IQ are graphically presented in Figure 2. Analyses of covariance were conducted in an effort to control the threat on a posthoc basis.

Qualitative Method

One of the six SLC classes was randomly selected as the focus of qualitative data collection procedures. These consisted of observation and structured and informal interview. I visited the class a total of 29 times during the school year with the intention of establishing a modified participant observation approach (Bogdan & Taylor, 1975), i.e., to become an accepted member of the normal ecological network of the classroom. Time limitations precluded more than a modified participant observation analysis.

I spent 30 hours participating in the day-to-day activities of the classroom. This included observation of classroom behavior, structured and unstructured, changing classes, of activities around class change, and extracurricular activities such as intramurals. In addition, I ate lunch at the school as frequently as possible. This activity varied from eating with the children in the cafeteria, to eating with the teachers' lounge or with the special education teacher and certain students in the classroom. Field notes were kept on all observations.

Interviews with the teacher occurred at least once a week. Many times topics which originated during in-school interviews were continued via telephone. Informal interviews with the students were held

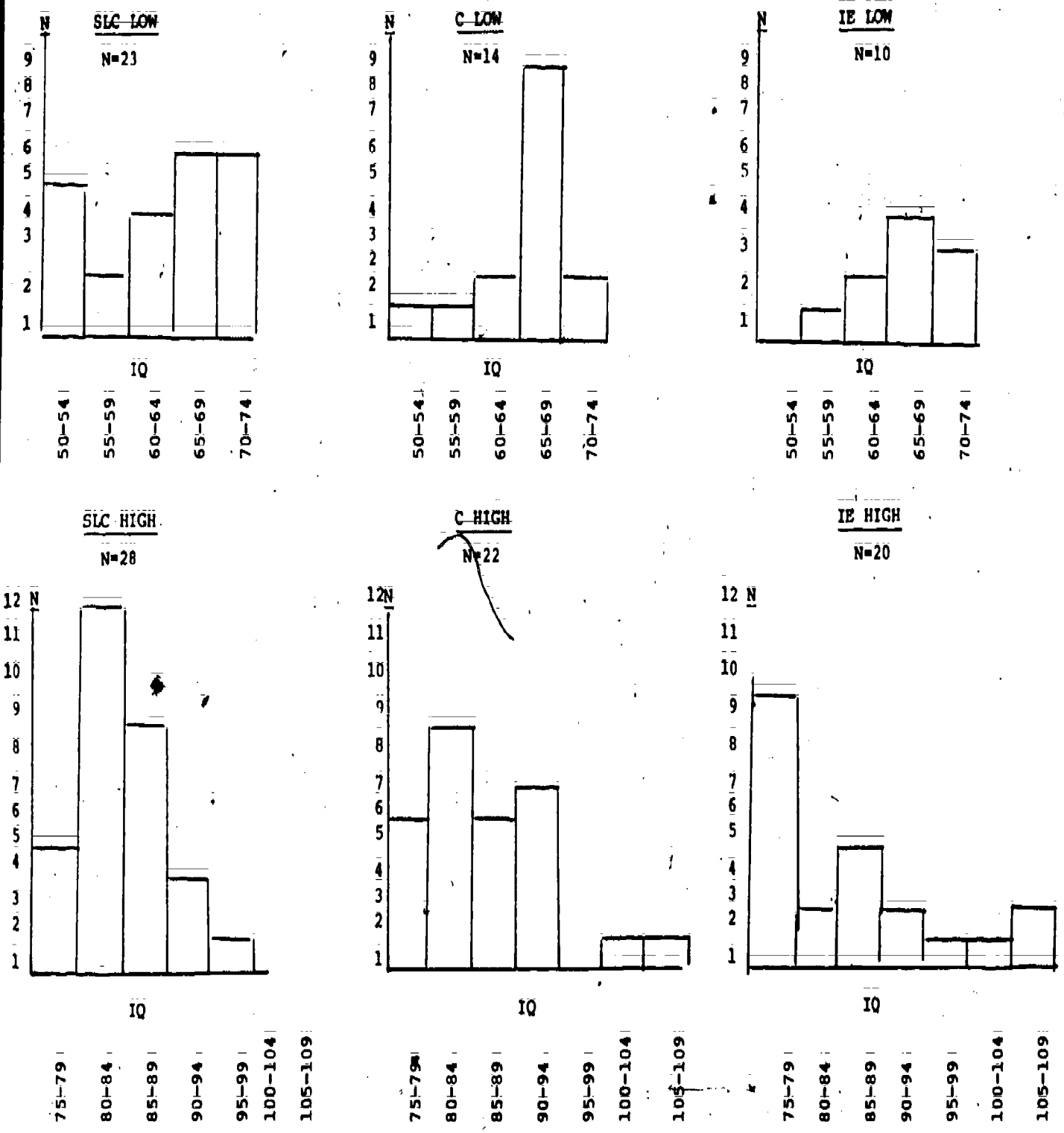


Figure 2. Distribution of IQs.

at the end of the school year. At the teacher's request, I had some contact with the parents of certain students.

Although the selected class was the focus of the qualitative methodology, each of the 15 classes in the study was visited for observation and teacher interview. Effort was concentrated upon the SLC classes to determine whether there was a basis for generalizing the results from the target class.

Summary

This chapter has presented discussions of the two methodologies used in this study. The quantitative portion of the study used a quasi-experimental design (Campbell & Stanley, 1966) with two independent variables (SLC and IE), four first-order dependent variables (general intellectual function, social inferences, problem solving, and social knowledge), and two second-order dependent variables (academic achievement and self-concept). The discussion includes aspects of research procedures and threats to internal, external, and statistical conclusion validity.

Qualitative procedures are also described. They included modified participant observation techniques, observation, and structured interviews.

CHAPTER IV

QUANTITATIVE RESULTS

The proposed analysis procedure was a Lindquist Type III repeated measures analysis of variance (Lindquist, 1953). This procedure was inappropriate for two reasons. First, the inclusion of ability as a blocking factor was based upon an assumption of homogeneity. That is, it was assumed that the distribution of ability across the 15 classes would be similar. This assumption was not supported. Indeed, a simple ANOVA indicated that the differences in IQ among the subjects in the three treatment groups approached significance with the SLC children having the lowest IQs (see Table 11). Second, no IQ data were available for 23 of the 143 children (16%); of the 23, 15 were comparison subjects.

TABLE 11

ANALYSIS OF VARIANCE--DISTRIBUTION OF IQs

Source	SS	df	MS	F	Probability
Between groups	499.78	2	249.89	1.69	0.1865
Within groups	17415.70	118	147.59		
Total	17915.50	120			
		Means	Standard Deviations		
	SLC	74.98	12.11		
	IE	79.80	12.03		
	C	78.28	11.83		

The analysis of covariance (ANCOVA) was judged to be a more adequate analysis procedure. Data from each of the six instruments were analyzed separately with the pretest serving as the covariate.

For the Standard Progressive Matrices, no significant differences were detected, F (2, 139) = 9.73, p = .6177 (see Table 12). The SLC children had a a raw mean of 25.95 and an adjusted mean of 26.34 with a standard deviation of 9.39. IE children had a raw mean of 27.48,

TABLE 12

ANALYSIS OF COVARIANCE--STANDARD PROGRESSIVE MATRICES

Source	SS	df	MS	F	Probability
Total	3260.67	141			
Error	3215.65	139	23.13		
Groups	45.02	2	22.51	.973	.6177

adjusted mean of 25.55. The standard deviation of the IE scores was 9.31. Comparison children had a raw mean of 24.31, adjusted mean of 25.07 with a standard deviation of 8.60.

On the Test of Social Inference, the 55 SLC students had a raw mean score of 41.06. The standard deviation was 13.69; the adjusted mean for the SLC children was 43.27. The IE subjects had a raw mean of 44.56, and an adjusted mean of 41.78 with a standard deviation of 11.22. The 55 comparison children scored 42.62 as a raw mean, and 42.08, adjusted mean. The standard deviation was 12.16. These scores

were not significantly different, F (2, 139) = .555, p = .5809 (see Table 13).

TABLE 13

ANALYSIS OF COVARIANCE--TEST OF SOCIAL INFERENCE

Source	SS	df	MS	F	Probability
Total	7234.45	141			
Error	7177.16	139			
Groups	57.29	2	28.65	.555	.5809

Experimental children performed significantly better than C children on the Matching Familiar Figures Test. The MFFT was used to measure the first-order dependent variable, problem solving. Two scores were analyzed for the MFFT: number of figures correctly matched and length of response time. For the number of figures correctly matched, SLC children had a raw mean of 6.36 (SD=2.25) and an adjusted mean of 6.22. The IE students had a raw mean of 6.24 (SD=1.73) and an adjusted mean of 6.24. The C subjects had a raw mean of 5.13 (SD=1.68) and an adjusted mean of 5.28.

In terms of number of figures correctly matched, significant differences were found, F (2, 139) = 5.004, $p < .01$ (see Table 14). A Newman-Keuls multiple comparison analysis indicated that while the two experimental groups were not significantly different from each other, each exhibited significantly better performance than the C children (see Table 15). The SLC children outperformed the C children

at the .01 significance level; IE children performed significantly better with a probability level of .05.

TABLE 14

ANALYSIS OF COVARIANCE--MATCHING FAMILIAR FIGURES TEST

Source	SS	df	MS	F	Probability
Total	447.47	141			
Error	417.41	139	3.00		
Groups	30.06	2	15.03	5.004	.0081

TABLE 15

NEWMAN-KEULS MULTIPLE COMPARISON TEST ANALYSIS OF COVARIANCE-MATCHING FAMILIAR FIGURES TEST

1 = C			
2 = SLC			
3 = IE		2	3
	1	.9**	1.0*
	2		.0

*indicates significance at .05 level.

**indicates significance at .01 level.

Latency (length of response time) on the MFFT approached significance, F (2, 139) = 2.235, p = .1087 (see Table 16). The raw means, standard deviations, and adjusted means are as follows: SLC = 11.99 (SD=747), 11.54, IE = 11.561 (SD=8.26), and 11.88, C = 9.21 (SD=6.14) and 9.46. A Pearson-product moment correlational analysis was conducted between mean number of figures correctly matched and latency. It yielded a correlation coefficient of .97 ($p < .01$).

TABLE 16

ANALYSIS OF COVARIANCE LATENCY-MATCHING FAMILIAR FIGURES TEST

Source	SS	df	MS	F	p
Error	5178.52	139	37.26	2.235	.1087
Groups	166.56	2	83.28		

On the Social Knowledge Assessment, no significant differences were found, F (2, 139) = .719, p = .5064 (see Table 17). The SLC children had a raw mean of 51.56 (SD=9.60) and adjusted mean of 52.91. IE students had a raw mean of 53.89 (SD=7.73) and adjusted mean of 51.58. The C students had a raw mean of 51.76 (SD=6.61) and adjusted mean of 51.80.

Data from the instruments assessing the two second-order dependent variables were analyzed even though no research expectations were

TABLE 17

ANALYSIS OF COVARIANCE--SOCIAL KNOWLEDGE ASSESSMENT

Source	SS	df	MS	F	Probability
Total	4615.01	141			
Error	4567.77	139	32.86		
Groups	27.25	2	23.62	.719	.5064

proposed. In the area of academic achievement as measured by the General Information Subtest of the Peabody Individual Achievement Test showed significant differences, F (2, 139) = 3.058, $p < .05$ (see Table 18). The SLC subjects had a raw mean of 29.53 (SD=13.63) and adjusted mean of 33.07. The IE children had a raw mean of 40.82 (SD=15.86) and adjusted mean of 36.45. The comparison children had a raw mean of 34.16 (SD=12.55) and adjusted mean of 33.26. A Newman-Keuls multiple comparison analysis (see Table 19) indicated that the IE children performed significantly better than SLC and C children at the .05 level of significance. There were no significant differences between SLC and C children.

Self-concept was assessed with the Piers-Harris Children's Self-Concept Scale. No significant differences were detected, F (2, 139) = 1.530, p = .2185 (see Table 20). The SLC children had a raw mean of 59.49 (SD=12.72) and an adjusted mean of 58.11. The IE children had a raw mean of 57.39 (SD=16.37) and adjusted mean of 59.02. For C children, raw and adjusted means were 57.82 (SD=10.86) and 58.22.

TABLE 18

ANALYSIS OF COVARIANCE--GENERAL INFORMATION SUBTEST, PEABODY INDIVIDUAL ACHIEVEMENT TEST

Source	SS	df	MS	F	Probability
Total	6158.65	141			
Error	5899.31	139	42.44		
Groups	259.54	2	129.77	3.058	.0487

TABLE 19

NEWMAN-KEULS MULTIPLE COMPARISON TEST ANALYSIS OF COVARIANCE--GENERAL INFORMATION SUBTEST, PEABODY INDIVIDUAL ACHIEVEMENT TEST

1 = SLC

2 = C

3 = IE

	2	3
1	.2	3.4*
2		3.2*

*indicates significance at .05 level.

TABLE 20

ANALYSIS OF COVARIANCE--PIERS-HARRIS CHILDREN'S SELF CONCEPT SCALE

Source	SS	df	MS	F	Probability
Total	9015.63	141			
Error	8821.40	139	63.46		
Groups	194.23	2	97.12	1.530	.2185

Summary

Data from six instruments, each measuring a first- or second-order dependent variable, were analyzed with the analysis of covariance. Two significant differences were found. Experimental children outperformed comparison students on the Matching Familiar Figures Test and the General Information Subtest of the Peabody Individual Achievement Test. These measures reflected the dependent variables problem solving and academic achievement.

CHAPTER V

QUALITATIVE DATA ANALYSIS

Four research expectations were proposed for the qualitative portion of the study. The purpose of this chapter is to present the information gathered with qualitative data collection procedures. Analysis of qualitative data was critical to this study for several reasons. First, the evaluation perspective adopted specifies that "A full evaluation tells a story" (Stake, 1967b, p. 5). Quantitative data support the story; they cannot be expected to provide a complete picture of what occurred. Second, the Social Learning Curriculum (SLC) is a comprehensive program which has been developmentally organized. The children and young people in this study had never been exposed to the program. Almost all had lengthy histories of negative schooling experiences, and as pre or early adolescents, they were in the midst of a difficult developmental period. It would be inappropriate to attempt to make any judgements on the basis of quantitative data collected during their brief exposure to the program.

Qualitative research expectations are stated in Chapter II. Following an introductory description of the teacher, class, and manner of implementing the SLC, results will be presented for each expectation.

Introduction

Qualitative data were collected in one randomly-selected SLC class. It was located in a large suburban junior high school serving a predominantly white, lower middle-class population. The class met in a portable classroom behind the school. Although the two special education teachers were not the only faculty assigned to portable classrooms, the one they shared was the most removed in proximity from the main building. The intercom system was serviceable in the classroom, the bells signifying class changes were not, however. The implications of the situation were not lost on the children. They were quite articulate in addressing the costs and benefits of "being kept back here." The primary cost was isolation from nonhandicapped peers; the 8-minute period allotted for changing classes was an important opportunity to meet friends, schedule after-school activities, and simply "be seen" with people. For the students in special education, a considerable portion of this time was devoted to traveling to the main school building. The benefit of the location was the privacy it afforded, the territory was supervised by the special education teachers. Although the school had a very adequate administrative staff, they seldom ventured into the area. Many of the students used the class change period to expend physical energy; they ran, wrestled, practiced football or baseball.

The class was composed of 15 students ranging in chronological age from 13-16 and in IQ from 50-96. Each child was officially classified mentally retarded, learning disabled, or behavior disordered; each was integrated with nonhandicapped peers for at least two of the six instructional periods of the school day. The most common form of mainstreaming

was integration into "regular" physical education and home economics or industrial arts classes. The physical education program was set up so that it alternated with study hall, i.e., a student attended physical education one day and study hall the next. Responsibility for monitoring study hall was shared by the entire faculty. This created the opportunity for most of the teachers to have some personal interaction with the children served in special education.

The special education teacher using the SLC expended a great deal of effort toward making the integration work as effectively as possible. She attempted to provide support to the other teachers who were working with the children and to the children themselves. The impact of her work was displayed in the collective attitude of the faculty toward the students in special education and toward this research project. They asked questions about the SLC, related anecdotes regarding a particular subject's behavior in their classes, and approached the entire situation with a reserved optimism. Frequency distributions for age, IQ, handicapping conditions, and class periods of integration with nonhandicapped peers are in Table 21. One student was black, the remainder were white; 10 were males and 5 were female.

The teacher of this class holds a master's degree in special education. She has seven years of experience in teaching exceptional children, two in her current school. Her primary concern from the initial contact by the research team to the final test administration was the welfare of the students. She worked very hard and held high expectations for herself, her students, and the research team. She approached the project in general and the SLC in particular with a "healthy skepticism." In her initial contacts with me, for example, she stressed

TABLE 21

CHARACTERISTICS OF THE CHILDREN IN THE QUALITATIVE CLASS

Handicapping Condition					
Behavior Disordered		Learning Disabled		Mentally Retarded	
Male	Female	Male	Female	Male	Female
2	1	7	2	1	2

Chronological Age							
13		14		15		16	
Male	Female	Male	Female	Male	Female	Male	Female
5	1	4	3	1	-	-	1

Periods of Integration with Nonhandicapped Peers					
Two Periods		Three Periods		Four Periods	
(Physical Education, Industrial Arts/ Home Economics)		(Physical Education, Industrial Arts/Home Economics, and Social Studies)		(Physical Education, Industrial Arts/Home Economics, and Social Studies)	
Male	Female	Male	Female	Male	Female
5	3	2	4	1	-

that her commitment to use the material would be contingent upon her assessment of its potential value to her students. She participated actively in the training workshop, asking questions of the curriculum developers and me.

After studying the material and attending the workshop, she committed herself to use the SLC. Her agreement took the form of an implicit contract, i.e., she would implement the SLC to the best of her ability in exchange for a certain amount of freedom and support from me. An example of this contractual situation was her wish to practice using the Logical Inductive Method (LIM) with material which she had developed. She wanted to maximize the impact of the SLC and thought that she could not do so until she felt comfortable with the method. Her part of the agreement was to keep the research team informed of her activities and their relationship to the implementation on the SLC; in return, she expected some consultative support.

The teacher used the SLC in the period designated for instruction in science. Students in special education (this group of 15 represented only one-third of her entire caseload) had class schedules like those of their nonhandicapped peers. Classes were labeled by subject; one of the special education teachers was responsible for teaching math and social studies; the other for language arts and science. All of the students in the SLC "science" class saw the teacher one other period of the day for language arts.

The teacher used Phase 12, Recognizing Basic Physical Needs from the published version of the SLC and Interacting with Others from the field-test version of the Problem-Oriented Social-Vocational Adaptation Program (POSVAP). Material was used four days a week. On Fridays,

students "earned" the right to supplementary activities associated with the curriculum.

Qualitative data were gathered through observation and interview. I visited the class 29 times over the course of the school year. Six of these visits were primarily for the purpose of administering criterion tests; the remaining time was devoted to gathering qualitative data. In all 10 hours of formal observation occurred, while an additional 20 hours were spent in the classroom.

Results

Development of the Ability to Think Critically

The teacher began the year with a unit on systems of the body. She had prepared the unit herself and used it for two reasons. First, it served as an introduction to the content of Phase 12 of the SLC; second, it gave her the opportunity to practice teaching inductively. Her movement into the inductive method was gradual. By the time she began using the SLC, she felt comfortable with the method.

Careful observation of the class, revealed that the adoption of the LIM was a disquieting experience for the children. They reacted to the change in different ways. Some seemed to be totally bewildered by what they perceived to be an abdication of their teacher's role in the normal pedagogical situation. Rather than presenting content and providing them with worksheets, the teacher spent the entire class period asking questions.

Others seemed persuaded that their opportunity to answer a question correctly had finally arrived. "They had no intention of missing the

chance" (Hall, Note 19) and hence became so enthusiastic as to be almost unmanageable. The first weeks of implementing the intervention, then, bordered on a state of chaos. The "traditional group," those who "had learned to play school" (Hall, Note 20) withdrew into bewildered frustration while their classmates argued over whose turn it was to respond.

The situation became more chaotic when the teacher attempted to do some of the supplementary activities. The children argued among themselves, seemed incapable of sharing materials, and demonstrated a distressing level of irresponsibility. The activities consisted of applied tasks such as making posters or collages around a certain theme. There was no indication of an organized approach to any aspect of the task. In the case of the actual products of their work, corrections were made only at the teacher's direction. Similarly, each element of the clean-up activity had to be specified and monitored.

Interviews with the teacher throughout this period of implementation revealed that she was both frustrated and discouraged. On the one hand, she was pleased by the enthusiasm of some children. On the other, she was discouraged by the almost total withdrawal of others. In addition, she was beginning to question her ability to direct the enthusiasm into constructive channels.

The SLC teachers held their first meeting at the height of this disintegration. Since the other teachers had begun teaching the SLC earlier, they could empathize and offer suggestions. Two of these were the possibility of a class reward and the addition of questions which required the children to repeat their peer's responses.

The teacher implemented the suggestions. The class could earn the right to see movies on Fridays by exhibiting on-task and prosocial behavior during the first four days of the week. (The rules were specified in behavioral terms for the children.) Interestingly, the movies were instructional rather than purely entertaining and related to content of the SLC whenever possible. Two rather minor alterations seemed to give the process a positive valence: The teacher served popcorn and allowed the children to ask questions about the films to her and each other.

The teacher worked with the material in a dedicated fashion; she studied it, modified it, and delivered it in a consistently inductive fashion. In the early stages of implementation, a consistent delivery required a great deal of preparation. She worked from the teacher's guide, the monograph on reasoning skills (Goldstein & Goldstein, 1980), and the transcription of the workshop notes (Hall, Note 17). In order to maximize the impact of the program, she had to identify for herself the relationship between the particular content objective and the stage of the Logical Inductive Method; no single lesson in the program represented the entire range of skills in the Inductive Problem Solving Process (IPSP). She took the teacher's guide with the content objectives, studied the exemplary questions to identify the proces skill they represented and strategized how she would present the material to the children. If she interpreted the emphasized process to be inference, she asked questions in a "what might happen?" format; if the process were generalization, she would ask, "Do you think you can make a rule?"

Interviews with the teacher over the first three months of the study indicated that as she practiced teaching in this fashion, she gained confidence in her ability to teach inductively and to plan for inductive teaching. The actual amount of planning time, and the anxiety associated with it decreased steadily.

The characteristics of the children presented in Table 21 indicate that they represented a very divergent group. The teacher was skillful in adapting the LIM to the varying levels of the children. She focused on the particular stages of the IPSP (Labelling, Detailing, Inferring, Predicting, Verifying, and Generalizing) specified in the lesson plans, but she never restricted herself to the targeted process. If she were attempting to work with inference, for example, she would pull the least skilled children into the activity by asking them to supply labels and/or details. She tried to match her perceptions of the child's skill to the aspect of the task. A child who could supply rules or generalization was seldom asked to label; the child who could only label or detail was frequently asked to repeat an inference or a prediction made by another child. The more highly skilled children were involved in the lessons by elaborating on their responses.

Observation of group instruction with the SLC revealed a steady progression of ability to handle the format of the program and to use the IPSP. The progression was neither uniform nor linear across the children. A few made rapid and regular gains. Some children exhibited long latency periods in which there appeared to be little if any progression; some in this group had begun to show forward progress by the end of the year. Others had not. Most of the children (10 out of the total 15) exhibited the up-and-back, "wavelike" pattern discussed by

Smith and Greenberg (1979). On one day, the child would be able to reach a generalization. In the next problem-solving endeavor, he/she might be unable to proceed beyond inference. On the whole, the class became quite effective at orally identifying the nature of the problem, at proposing possible solutions, predicting the best, verifying logically the choice, and arriving at a rule or generalization.

In terms of the theoretical base, the class could, when presented with a Mass, break it apart through the differentiation process and re-assemble or integrate it into an entity which was congruent with their meaningful environments. Some individual students were able to accomplish this; others were not. Individual students are discussed in detail in the section on the administration of the THINK (Appendix D).

Even more encouraging than the changes in the students' performance in instructional situation was their improved ability to function in the less structured supplemental activities. The teacher continued to use the supplementary activities, in spite of a chaotic start for two reasons. First, through these activities she discovered that many of the students had difficulty with very basic perceptual and conceptual activities such as cutting, estimating the size picture needed to fill a particular space, categorizing, and classifying.

The nature of the subject-area program operating in the school impeded detection of these deficits unless they had been noted on the previous staffing reports. At the same time, these deficiencies had the potential of creating serious problems for the students in the mainstreamed courses: industrial arts and home economics. Second, the students enjoyed the activities. Several of the children made

"extra" posters during free time, brought magazines or simply asked when they could repeat certain activities.

In addition, observation revealed that these activities allowed the teacher to capitalize on the methodology. Initially, as previously stated, the children corrected their work only when the teacher intervened. Her method of intervention was to use the child's inadequate product as the focus of the LIM. Rather than saying, "I cannot accept that because you failed to follow instructions," she would ask the child to tell her what the task had been. If he/she could relate the task accurately, she would then ask why he/she had chosen the incorrect picture. She would continue to work through the method until the child seemed to have some grasp of the problem and the factors which had contributed to his/her error. If the student could not repeat the task, she would supply it and guide him/her step by step through an appropriate response.

Observation of the students over the intervention revealed two types of behavior which had been nonexistent at the initiation of the project. Gradually, the children began to seek verification of their work from their peers. This was a movement away from the haphazard selection of pictures which characterized the first few weeks of intervention, and the dependence on the teacher which characterized the next six weeks. This was particularly encouraging for two reasons. First, most of the students seemed to have developed an internal need to verify (at least within the parameters of the classroom) and second, they perceived each other as capable of providing verification. The teacher, at the end of the intervention, was serving as a resource rather than the source of information.

The second type of change was the gradual assumption of responsibility by the students for the status of materials. Initially, clean-up activities had been structured, of necessity, in task-analytic fashion which required vigilant monitoring on the part of the teacher. As the sense of order returned to the group, she began to fade the structure. Her first step was to call the students' attention to the fact that 10 minutes remained in the period and to outline the clean-up tasks. Her next move was to mention only the time. Interview data revealed her astonishment when one day she looked up to find the students putting materials away. In response to her look of amazement, one student replied, "We only have 10 minutes left in the period."

The most elaborate of the class' supplementary activities was to prepare and serve a meal. The fact that the teacher considered it a possibility was an indication of positive movement (Hall, Note 21). When she attempted to discuss the activity with the principal, he became so distressed at the notion that she decided to capitalize on the isolation of her classroom. The students determined the menu, shopped for the items after school, and delegated responsibility for preparation, serving, and clean-up. They implemented the activity without incident to their delight and the astonishment of the entire staff of the school.

Development of the Ability to Act Independently

Theoretically, the ability to act independently has two components. The first is the possession of an internalized problem-solving strategy. The second is the perception of oneself as competent to manage one's own behavior. Independent action combines the cognitive and affective domains in that a person who can act independently has a store of facts

and concepts and is able to activate them appropriately. The extent to which the individual succeeds in acting independently influences the probability of the individual's being designated retarded. The development of the ability to act independently is, then, the ultimate objective of the SLC.

The observations concerning the behavior of the students during the supplementary activities reported under Research Expectation I are related to their ability, as a group, to act independently. Clearly, the students progressed individually and as a class in their skills in these activities. Beyond classroom interactions, it was difficult to assess ability to act independently as a function of exposure to the SLC.

Observational and interview data indicated that some of the children were capable of functioning adaptively and independently. Others were not. The difficulty lay in attempting to establish a relationship between the functioning level and the intervention. In order to demonstrate a relationship, one would be obliged to evaluate a long-term objective on the basis of short-term intervention.

A variety of factors combine to increase the potential danger of such speculation. The first is the complexity of the ability being assessed; the second is the tremendous diversity of characteristics exhibited by the children. Of the 15 children in the group, 5 had serious emotional or behavioral disorders. Quantitative data from 3 of these students were eliminated because they did not complete the academic year in the class. One was placed in a residential treatment center; the other two were involved in automobile accidents for which they were directly or indirectly responsible. Data from the other two students

were included even though they missed considerable periods of instruction due to hospitalization for residential treatment or suspension.

Any attempt to draw conclusions beyond those already presented regarding the students' in-class behavior is beyond the scope of the data. Some students demonstrated changes in behavior which might be interpreted as precursors of independent action. To avoid unwarranted speculation, these will be discussed in terms of comprehension of the extrinsic value of academic skills or attitudes toward school.

Development of Awareness of the Extrinsic Value of Education

Data relating to this expectation were collected with interview and observation techniques. Structured interviews were conducted with the students in an attempt to explore the extent to which they viewed their schooling experience, particularly the SLC, as having extrinsic value. Formal interviews with the students were conducted in May. The format is presented below.

1. What did you do in science this year?
2. Why do you think you did that?
3. Do you think it was an important thing to do? Why or why not?
4. Was science different from your other classes? If so, how?

The students responded to the questions in a variable fashion. All students were able to relate the content of instruction; since the teacher had used the phases on physical needs and interacting with others, they typically responded that they studied the body and the personality.

One student (CA = 16, IQ = 50) was unable to respond to questions 2, 3, and 4. Two other students supplied rather rote answers to the

effect that they had studied the content because the teacher wanted them to learn it. They indicated that they thought it was an important thing to do; they did not, however, know why.

Answers from other students to the second and third questions indicated a qualitatively stronger comprehension of the extrinsic aim of the instruction. Some examples are,

1. "We focused on ourselves. If we studied animals, what good would that do?"

2. "We studied what to expect. I mean, you can do lots of things or eat lots of things, but you need to know what to expect if you do."

3. "We talked about how you can get more friends, and how it's not always easy."

4. "We studied personality. That was important because if you don't know how to act, you may act like a goof. Then you won't have friends."

5. "We studied about being responsible. That means doing your job whatever you're doing, like being a friend or working."

An interview with the teacher revealed another incident which was considered to be strong support for the establishment of an extrinsic value to the schooling experience.

One of the lessons in the POSVAP phase focused upon personality characteristics or abilities that a child considered most in need of change or improvement. The students were provided with a checklist of 35 "common teenage problems." On the blank marked "other," one child, classified EMR, wrote, "I can't read." The child's family lives in a rather isolated rural area, and he is the youngest of five children. The entire family is functionally illiterate with all the siblings

having dropped out of school. When the teacher talked with him about this, he said, "If I don't learn to read when I'm in school, I won't be able to do anything when I'm out of school."

Development of Positive Attitudes Toward School

Data dealing with this expectation were gathered from teacher interviews and observation. Quantitative assessment of self-concept indicated that with the exception of two children, both of whom were among the five children designated emotionally disturbed, the mean self-concept score was "normal." This finding was congruent with previous research (Rogers, Smith, & Coleman, 1978; Strang, Smith, & Rogers, 1978).

Given this, the focus of the data relative to this expectation was upon the teacher's perceptions of verbal and nonverbal attitudinal changes in two groups of children. The first was composed of seven children who were academically mainstreamed. The second group consisted of three chronic absentees.

At the beginning of the year, only one of the seven students indicated any positive feelings toward his/her mainstreamed academic classes. They complained that the work was too difficult and insisted that they were doomed to failure. The fact that this period coincided with the initial implementation of the SLC may have accounted for some of their "overenthusiastic" responses to questions they felt they could answer. Several of the students asked me to "certify" that their performance on the pretests precluded any opportunity of success in the regular class. Two of the nonattenders became physically ill and

vomited to avoid having to attend regular classes. Others begged the special education teachers to allow them to stay with them throughout the day.

The children had been carefully placed in the regular classes; the school used some ability grouping in assigning students so there was a reasonable expectation of success in every case. The teacher, and in some cases, I, worked with the children, the regular class teachers, and the parents in attempting to deal with the situation. The activities of the POSVAP lessons lent themselves to the open discussion of the factors which contributed to their fears, and to the teachers' actions.

Of the eight children composing the two groups, there was strong qualitative evidence of change in five. Two of the nonattenders began to come to school on a regular basis. One child articulated consistently his attention to "work his way out of special education." He was to improve his performance in his classes enough to make this a possibility. Three others gradually accepted their regular class placements and maintained satisfactory grades. The fifth child improved his attendance and performance in special education classes. There was very little change in his expressed attitude toward his mainstreamed classes or in his performance there. The third nonattender showed no improvement; he was actively involved in drug sales. Many of his absences were due to suspension.

In addition, the manner in which the students dealt with the criterion testing reflected the same patterns of change. The initial testing was, for some of the children, very anxiety-provoking. This

was revealed not so much in the responses per se but rather in the speed with which they worked, their state of tension, and the comments they made regarding the tasks. Although every effort was made to convince them that the purpose of the study was to evaluate the SLC rather than them, they were persuaded that they would do very poorly.

Their behavior during posttesting was much more relaxed and more achievement-oriented. They approached the tests willingly and with attitudes of confidence. Caution must be exhibited in interpreting these results for two reasons. First, the children had become quite familiar with me, and their contact was, for the most part, positive and nurturant, i.e., I was in the classroom without responsibilities for discipline. In addition, the children had taken the tests previously so they were not a totally new experience.

Summary

The purpose of this chapter was to describe the results of qualitative data. Data were collected in a randomly selected SLC class; information about the location of the class, the students, teacher, and portions of the SLC employed have been presented. Four qualitative research expectations were proposed. The first, children taught with the SLC will exhibit the ability to think critically, was supported. The second expectation, children taught with the SLC will be able to act independently, was neither supported not refuted by the data. The period of intervention was inadequate for reaching conclusions regarding this expectation. The expectations that students taught with the SLC would be able to use knowledge and skill acquired in school to solve daily living problems and would have more positive

attitudes toward school were accepted with qualification. There were data to support both expectations. The third expectation was qualified by the restricted period of intervention; the fourth, by the difficulty of separating the interaction of teacher and treatment effects.

CHAPTER VI

CONCLUSIONS, DISCUSSION, AND IMPLICATIONS

This chapter has two primary purposes. The first is to present the conclusions from both quantitative and qualitative data and to discuss them. The discussion will include interpretation of the work within the parameters of the theoretical and empirical literature reviewed. The second purpose is to identify the implications of this study for future research.

Conclusions

I. Quantitative Data

A. Treatment Effects

A significant main effect for treatment was found on the first-order dependent variable of problem solving. SLC subjects exhibited superior performance to the control children on the Matching Familiar Figures Test (Kagan et al., 1974). IE children in turn performed significantly better than C subjects on this measure.

A qualified main effect for treatment was detected for the second-order dependent variable, academic achievement, on the General Information Subtest of the Peabody Individual Achievement Test. The effect favors the IE children over both C and SLC students. It is qualified because the test was used

to measure the second-order dependent variable of academic achievement upon which no research expectations were proposed.

II. Qualitative Effects

A. Strong support exists for the research expectation that children taught with the SLC will develop to think critically.

B. Qualified support exists for the other three research expectations, children taught with the SLC will be able to act independently, will be able to apply academic skills to solve daily living problems, and will have more positive attitudes toward school.

Discussion

Quantitative Data

Initial examination of the quantitative data analyses indicates only one main effect for treatment. This effect was derived from the Matching Familiar Figures Test (MFFT) and provides support for the assertion that children receiving either experimental treatment were more skilled in "matching familiar figures" than C counterparts. Although it is the only significant treatment effect among the first-order dependent variables, its probability of .01 argues against its being explained in terms of an inflated significance level due to multiple analyses. While the time difference between the groups is not statistically significant, it is substantial. The SLC children exhibited an average response time of 11.76 seconds, the IE children 11.26, and the C students 9.63 seconds. A Pearson-product moment correlation

analysis was conducted between mean response time and number correct. It produced a correlation coefficient of .97, ($p < .01$). One would expect both programs to increase reflectivity in children. This finding supports the expectation.

One additional main effect occurred on the second-order dependent variable of academic achievement as measured with the General Information Subtest of the Peabody Individual Achievement Test. This effect ($F = 3.058$; $p < .05$) refelcts the superior performance of the IE children over the SLC and C subjects. If one adjusts the alpha level to control for multiple analyses, this difference might no longer be significant.

At an elementary analytical level, the data indicate that most of the quantitative research explanations were not supported. Data must be examined, however, within the context of threats to Statistical Conclusion Validity (Cook & Campbell, 1979). Four of the seven threats proposed bear directly upon interpretation of the quantitative data.

The first is the threat of low statistical power. Power analyses were conducted in the format specified by Welkowitz, Ewen, and Cohen (1976). They are presented in Table 9 (p. 112). Power coefficients with the exception of the PIAT are small. This decreases the confidence with which a conclusion of no difference between the groups can be made.

The second threat which clouds interpretation of the data comes from psychometric properties of the criterion measures. The problems created by the relatively low stability reliability of the instruments are exacerbated by the fact that only one of the tests, the TSI, used handicapped children in the norming sample. The handicapped children in the TSI sample do not, however, really "match" those in the current sample

(Edmonson, Note 22). The extent to which an instrument is unreliable in combination with the degree to which the research sample compares to the norming sample increases the amount of raw score difference necessary for significance.

The third and fourth threats to Statistical Conclusion Validity are related theoretically, and in this study, pragmatically. The third threat deals with uniformity of treatment implementation; the fourth with variations in subject characteristics. The research design specified that students would be nested under teachers within treatments. It was proposed on the assumption that the distribution of students in terms of ability throughout the Noncategorical Comprehensive Development (NCD) classes would be reasonably equivalent. This would allow the Ability Factor with the levels of high and low to be fully crossed under the teachers within the treatments.

Had this occurred, researchers would have had an empirical basis for examining the variable impact of the teacher upon both high and low ability children. In combination with the monitoring of the treatment implementation through qualitative data procedures, the threats would have been reduced. The distribution of the children according to ability did not approach an equivalent distribution. Indeed, a one-way analysis of variance of the IQ scores of the subjects reveals that the differences in IQ approached significance with the children receiving the SLC having the lowest IQs.

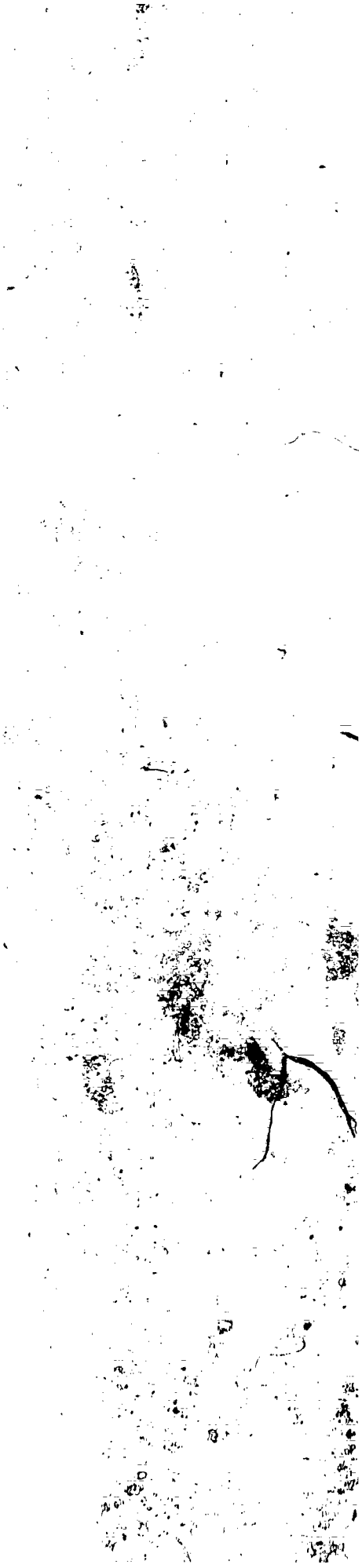
Another critical characteristic of the children which varied was socioeconomic status. Four of the comparison classes served children of predominantly middle-class background as determined by

area of residence. Only two of the SLC and two of the IE classes served middle class children.

Careful efforts were made to monitor the implementation of the two experimental programs. I made a total of 239 visits to the 15 classes over the course of the school year and spoke frequently with the teachers by telephone or in informal meetings. Observation and interviews indicated that each of the teachers was making a concerted effort to implement the program within the parameters of his/her interpretation of the developers' intention and the realities of his/her particular group of students. Uniformity of intention did not, however, translate into uniformity of implementation. The clearest example of this is the tremendous variability in the amount of material covered. Of the six SLC teachers, one taught four complete phases; two taught two phases and the other three presented material from only one. A similar condition obtained in the IE groups. All three teachers taught parts of four instruments; one teacher provided in-depth instruction on every page of the four instruments; one taught most of the pages, and one taught only parts of the instruments.

Within the context of Statistical Conclusion Validity (Cook & Campbell, 1979), the data regarding the treatment effect are inconclusive. The data do not demonstrate that there was a significant treatment effect; neither, however, do they refute the possibility of such an effect.

It should also be remembered that the comparison teachers were chosen from an initial pool of "competent" teachers; my observation indicated that they were actively attempting to meet the needs of



children. Furthermore, the presence of the research staff affirmed their efforts.

The quantitative results of this study are congruent with the theoretical expectations of Feuerstein (1979, 1980, Note 10, Note 11) and Goldstein (Note 1, Note 2, Note 5, Note 8). Both programs are cognitive interventions with long-term objectives. The changes each intervention seeks to promote, i.e., improvement in the ability to learn or to think and the development of skill in thinking critically and acting independently require intense intervention over a much longer period of time than the nine months of this project. In addition, changes in these abilities are not easily detectable with the psychometric instruments currently available.

In a similar fashion the experience of conducting the research and the results it yielded support and elaborate the evaluation perspective adopted. No "large differences" (Scriven, 1967, p. 66) which could be attributed to the experimental programs were detected. Neither, however, did this project have the "multiple push approach" which Scriven (1967) thinks might make such differences possible. The threats to validity proposed by Campbell and Stanley (1966) and Cook and Campbell (1979) obtained and had an impact upon the research in spite of a priori attempts to control them. Stake's emphasis upon the evaluator's descriptive responsibility, became the basis for the qualitative data collection.

In terms of empirical research, the results of this study are comparable to either short-term evaluation studies such as those done by Clark (1967), DeBoer (1974) Goldstein et al. (1969), Petry (1973), and Romeo (1975). Interventions of longer duration have tended to find

significant differences (Feuerstein et al., 1979; Goldstein et al., 1965; Gray & Klaus, 1970; Weikart et al., 1974).

The results according to particular instruments are congruent with previous work. The findings of the relationship between reflectivity and performance on the MFFT are similar to those found by Kagan et al. (1964), Smith and Singer (Note 23). Performance on the TSI parallels that of the children in Clark's (1967) study. In so doing, the results oppose the findings of Edmonson et al. (1967). The findings on the SPM and the General Information Subtest of the PIAT are similar to those found in the previous research on IQ (Haywood & Smith, 1981; Rothaizer, 1981). The results on the self-concept measures confirm the work of Rogers et al. (1978) and Strang et al. (1978).

Qualitative Data

The qualitative data provide strong support for the first research expectation, i.e., children who have been taught with the SLC will be able to think critically. Although the focus of the qualitative data collection was upon a single class, sufficient observation and teacher interview occurred in the other five classes to allow a generalized conclusion across all SLC subjects. All 55 of the children who were taught with the SLC exhibited some progress in this area. Progress was neither uniform nor linear. Some children made rapid and consistent gains as evaluated by teacher reports, observation, and performance on certain criterion measures such as the THINK (Smith & Greenberg, Note 16) and the TSI (Edmonson et al., 1974). Some students exhibited long periods of latency in which they appeared to make little progress before they began to exhibit skill in some stages of the IPSP. The majority of

the children demonstrated the up-and-back pattern which Smith and Greenberg (1979, 1981) have called a wavelike progression. The amount of progress a child made appeared to be a function of the skill of the teacher in using the LIM and the ability of the child. High ability children with strong teachers made impressive qualitative gains.

Theoretically, the ability to think critically is a precursor to the ability to act independently (Goldstein, Note 8). The strong support of the first expectation in combination with the observation of steady improvement in the children "to manage themselves" in supplementary activities within the classroom suggests that with longer intervention this expectation could have been fulfilled without qualification.

The third and fourth research expectations, namely, children taught with the SLC will be able to use academic skills to solve daily-living problems and will have more positive attitudes toward school have been accepted with qualification. The qualifer to this expectation, in opposition to the previous one, is not so much the length of the intervention but rather the difficulty of attributing change to the program. There were no data which suggested that the Social Learning Curriculum by itself enabled children to apply academic skills or feel more positively about school. There were data which indicated that when it was used effectively by teachers, there was such change. In May, an observer visiting one of the SLC classes asked the teacher, "Does it work?" The teacher asked for clarification and the observer inquired, "Are the children different now from what they were in September?"

After a moment of thought, the teacher answered, "Yes, I think they are different. They may be different because of the SLC; they may be different because they are nine months older, and they may be different because they have been with me" (Hall, Note 24).

Implications

Review of the literature of special education reveals a pervasive theme, the dissatisfaction with "positions which have been posited on a philosophical rather than a research foundation" (Gickling & Theobald, 1976, p. 326). Perhaps the clearest implication of this study is the care which must be taken in establishing an appropriate "research foundation."

The report of this research represents an attempt to tell the story (Stake, 1976b) of what happened when a group of teachers used Instrumental Enrichment or the Social Learning Curriculum. The implications for future research were identified within the parameters of post hoc analysis of the strengths and weaknesses of the study. The strengths are:

1. A prior recognition of the limited control held by researchers over many aspects of the research setting

2. A priori recognition of the need to acquire as much information as possible about the factors which limited researchers' control

3. A priori recognition of the inadequacy of either quantitative or qualitative data by itself.

The weaknesses are:

1. Failure to anticipate the impact of certain factors which might have been controlled

2. Over emphasis of quantitative data collection to the neglect of qualitative.

Strengths

The strengths of this study derive from the hearty respect for the problems of conducting research in the public schools. An initial assumption which was maintained throughout the study was that the burden-of-proof was upon me to establish credibility with personnel at all levels of the school system. The realities of fulfilling this assumption were quite demanding, and involved committing much time to an array of people including central office personnel, principals, school secretaries, guidance counselors, psychologists, social workers, and teachers. The time spent with these people could not, of necessity, be restricted to the school day. It was not uncommon, therefore, to speak with people after school, at night, and on week-ends.

The establishment of credibility served two primary purposes. First, it influenced persons who had power within the system to use that power for the advancement of the research. Upon no occasion did a school system employee violate school policies for my benefit. They simply operated within those policies to facilitate the project whenever possible. Probably the most common example was the use of "advance telephone calls" followed by the written paper work. Rather than having me wait for paperwork to proceed through the system, central office personnel and school principals would establish verbal agreements which were later confirmed procedurally.

Second, the establishment of credibility facilitated the acquisition of information. Two types of information were critical to the

interpretation of data. The first type was institutional. The policies of a large public school system may seem to be confusing at best, irrational at worst. Any judgement of an educational intervention must include some consideration of institutional factors because they affect results. The reality is that while practices characteristic of the current system "did not spring up by accident, but rather, emerged in response to organizational needs" (Kirp, Buss, & Kuriloff, 1974, p. 122), access to information regarding those needs may be unavailable to those outside the system.

The second type was personalistic. This included the array of personal and interpersonal variables which affected the implementation of the interventions and the assessment of children's progress on criterion measures.

The third strength of the study was the use of two methodologies. The proposed design for this study included both quantitative and qualitative components. The design was influenced by previous work, particularly that of Goldstein, Mischio, and Minskoff (1969). They conclude their report with the following observation,

> We need to re-assess the relevance of research designs for classroom and other institutional studies. Obviously, the biological model confuses more than it clarifies. One should not have to devote so much time and energy to qualifying results because of design insufficiencies and confusions. (p. 112)

The intention of the dual methodologies was to use the quantitative data to form the structure of the conclusions with the a priori understanding that quantitative data are meaningless without interpretation. Accurate interpretation and hence meaningful conclusions are dependent upon systematic recording of observational and interview data.

Weaknesses

Two inadequacies of the research provide direction for future endeavors; each can be viewed through the perspective of "damn fine hindsight" (Gray, Note 25) factors which might have been controlled. The first weakness was my failure to examine, on a pilot basis, "random heterogeneity of subject characteristics" (Cook & Campbell, 1979, p. 43). In selecting the participating teachers, I should have attended to the characteristics of the children who were likely to be assigned to the teachers. Had this factor been considered, some of the differences in characteristics, particularly socioeconomic status might have been avoided.

The second weakness is the over-emphasis of quantitative data collection to the neglect of the qualitative. In order to deal with the threats to validity of testing and instrumentation all criterion measures were administered by the research assistant or me. Six criterion measures were employed in all, with four administered on a pretest, posttest basis and two given on a pretest, posttest, posttest schedule. Children were never taken from preferred activities for testing, and if teachers indicated concerns about the timing of the assessment, it was postponed. A variety of strategies were implemented to attempt to collect quantitative and qualitative data simultaneously. These included teacher logs (example pages are included in Appendix G), audiotapes, observation by one member of the research team provided to the other with audiotapes and notes. "These (particularly the last) data defied analysis" (Goldstein et al., 1969, p. 31).

Clearly, both types of data are important. Each quantitative measure was conceptually justified and at this point in the process,

it would be extremely difficult to specify which quantitative procedures would have been eliminated. The decision of the nature of data to be collected would seem to rest upon several factors.

1. The purpose of the study. If one is conducting research which may serve as the basis of longitudinal study, one might wish to collect a strong quantitative foundation. If, on the other hand, the study has a relatively short "life expectancy," one might seek a more even balance of the two types of data.

2. The size of the project staff. Obviously, one can collect more data with more workers. The task of the researcher, with a larger staff, is to maximize the quality of all the data which are collected. In this particular study, the research team had worked with each subject in collecting quantitative data. The movement into the classroom for observation was a natural one for the researchers, teachers, and students, and the quality of information was stronger

CHAPTER VII

EPILOGUE

To conclude the report of this research without addressing directly the naivete of the objectives of this and many other projects is to deny an ethical responsibility. The discussion of factors which make the objectives of this project simplistic may be avoided in scientific reports because even though "honestly descriptive of the situation, it smacks of the tabloid" (Gray et al., Note 13, p. 11).

After a year's research, which included 239 visits to the 15 classes (3,590 miles) and 63 after-school telephone calls to teachers, the notion of sending the teachers into the classes with these experimental materials and expecting them to effect change can only be cogpared to sending doctors onto battlefields with first aid kits and expecting them to save lives. The fact that they took the SLC kits and IE instruments, that they used them conscientiously, and that they not only endorsed them but demonstrated quantitative and qualitative change in the majority of the children is an accomplishment of the first order.

The realities of "modified participant observation" were to come face-to-face with situations which indeed "smack of the tabloid" (Gray et al., Note 13, p. 11). Of the 163 children who began the year in the study, 20 were suspended, most more than once. Nine were arrested for offenses ranging from shoplifting to auto theft. One had a baby, two were sexually abused by parents or step parents, two

achieved somewhat high positions in local drug rings, eight were admitted to psychiatric therapy programs, three were seriously injured in automobile accidents. The mother of one of the subjects was shot and killed by police while she slept in a motel room; the brother of two of the comparison students, a high school special education student, was charged with first-degree murder after causing an accident in a stolen car.

Working with these teachers revealed that they spent almost as much time in social work activities as they did in teaching. They were in emergency rooms, delivery rooms, intensive-care waiting rooms, at police headquarters, the juvenile court, and on the streets looking for their students.

Why were the teachers willing to give so much time and energy to such a seemingly thankless task? With due consideration to the plausible hypothesis of massive masochistic tendencies (extending from curriculum developers to researchers to teachers), the reasons they gave were consistent: "I am not ready to give up on these kids" and "There is nobody else to do it."

The data, quantitative and qualitative, support the teachers' faith in the potential of the children. While they did not "become as normal children once they were properly taught" (Steinback, 1918, cited by Goldstein, 1957, p. 147), they made very significant progress. It would be tragically misleading, however, to close this report by suggesting that anyone who participated in the project regards this progress as sufficient to save these children or this society.

Perhaps the time has come to demand that mild handicapping conditions be regarded as a "public issue" rather than a "personal trouble"

(Mills, 1959). Haywood (1979) has emphasized the enormity of the problem of mild retardation stressing that over 6,000,000 people in the United States fall into the IQ range of 50-70. This does not consider persons who were previously considered mildly retarded or borderline (IQ = 71-85), nor does it include people of "normal intellectual functioning" who have specific learning disabilities.

In previous eras of American public life, the emphasis was upon "children-at-risk." We can no longer allow ourselves the luxury of relegating the problem of mild handicaps to the domain of "personal troubles" (Mills, 1959). If we are to adopt an "active-modification approach" (Feuerstein, 1970) to this problem, we must ground the approach in the public domain and speak of society-at-risk.

In discussing his notion of a "multiple-push approach," Scriven (1967) emphasized that we must be satisfied with small gains unless we are willing to attack "not only the curriculum, but the student grouping procedures, the teacher presentation, the classroom time allocation" (p. 66). The results of this project support the assertions of Feuerstein (1970) and Goldstein (Note 1) that for mildly handicapped children, Scriven's "multiple-push approach" is necessary but not sufficient. From Feuerstein's (Note 11) perspective, teachers and support personnel must be committed to the idea that the child exists as an open system which is susceptible to modification. From Goldstein's (Note 1) point of view, teachers should be expected to teach, it is unreasonable to expect them to write curriculum, evalute programs, assess children, complete the paperwork for procedural compliance with regulations, and serve as counselors and social workers.

This research project examined the effectiveness of two long-term interventions over a single academic year. The quantitative data reflect strong and consistent gains among the children over time. The data also indicate trends in favor of both groups of experimental children; it is reasonable to expect that with a longer intervention, significant differences might be achieved. Qualitative data affirm these differences. A final question remains: What might these teachers have been able to do with more time and adequate support services?

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APPENDIX A

MEANS, SD, AND HETEROGENEITY OF VARIANCES

TABLE 22

ANALYSIS OF COVARIANCE--RAVEN'S STANDARD PROGRESSIVE MATRICES GROUP MEANS, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean /	Covariate Mean	Covariate Standard Deviation
55 SLC	25.95	9.39	26.34	22.45	8.04
33 IE	27.48	9.31	25.55	25.12	8.90
55 C	24.31	8.60	25.07	22.04	9.45

Homogeneity of Within-Class Regression

F = 1.682 with 2 and 137 degrees of freedom.

p = .1879

TABLE 23

ANALYSIS OF COVARIANCE--TEST OF SOCIAL INFERENCE GROUP MEANS, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean	Covariate Mean	Covariate Standard Deviation
55 SLC	41.06	13.69	43.27	31.95	12.04
33 IE	44.56	11.22	41.78	37.53	12.15
55 C	42.62	12.16	42.08	35.02	10.66

TABLE 24

ANALYSIS OF COVARIANCE--SOCIAL KNOWLEDGE ASSESSMENT GROUP MEAN, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean	Covariate Mean	Covariate Standard Deviation
55 SLC	51.56	9.60	52.91	44.18	8.99
33 IE	53.89	7.63	51.58	49.64	8.75
55 C	51.76	6.61	51.50	36.13	8.11

Homogeneity of Within-Class Regression

$F = 3.269$ with 2 and 137 degrees of freedom.

$p = .0398$

TABLE 25

ANALYSIS OF COVARIANCE--MATCHING FAMILIAR FIGURES TEST GROUP MEANS, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean	Covariate Mean	Covariate Standard Deviation
55 SLC	6.36	2.25	6.22	5.73	2.55
33 IE	6.24	1.73	6.24	5.33	2.10
55C	5.13	1.68	5.28	4.95	2.06

Homogeneity of Within-Class Regression

F = 0.678 with 2 and 137 degrees of freedom.

p = .5137.

TABLE 26

ANALYSIS OF COVARIANCE--PEABODY INDIVIDUAL ACHIEVEMENT TEST GROUP MEANS, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean	Covariate Mean	Covariate Standard Deviation
55 SLC	29.53	13.63	33.07	24.09	12.93
33 IE	40.82	15.86	36.42	32.70	14.96
55 C	34.16	12.55	33.26	28.91	12.27

Homogeneity of Within-Class Regression

F = .188 with 2 and 137 degrees of freedom.

p = .8301

TABLE 27

ANALYSIS OF COVARIANCE--PIERS-HARRIS SELF-CONCEPT SCALE FOR CHILDREN GROUP MEANS, STANDARD DEVIATIONS, HOMOGENEITY OF WITHIN-CLASS REGRESSION

Group	Raw Mean	Standard Deviation	Adjusted Mean	Covariate Mean	Covariate Standard Deviation
55 SLC	62.98	11.33	61.70	57.31	12.96
33 IE	58.79	14.35	60.30	53.61	13.68
55 C	58.65	11.24	59.03	55.11	9.78

Homogeneity of Within-Class Regression

$F = 2.101$ with 2 and 137 degrees of freedom.

$p = 0.1242$

TABLE 28

NEWMAN-KEULS MULTIPLE COMPARISON TEST
MATCHING FAMILIAR FIGURES TEST

1 = C

2 = SLC

3 = IE

	2	3
1	.9**	1.*
2		0.0

**indicates significance at the .01 level.

TABLE 29

NEWMAN-KEULS MULTIPLE COMPARISON ANALYSIS-PIAT
PIAT GENERAL INFORMATION
ANALYSIS OF COVARIANCE

	2	3
1	.2	3.4*
2		3.2*

*Significance at .05 level.

1 = SLC

2 = C

3 = IE

TABLE 30

HARTLEY'S F-MAX FOR HOMOGENEITY OF VARIANCE
ANALYSIS OF VARIANCE--TREATMENT
(SLC, IE, C) BY ABILITY
(HIGH, LOW)

$F_{.95}$ = 6.92, 6 groups, 10 df

Standard Progressive Matrices:	F_{max} = 2.66
Test of Social Inference:	F_{max} = 2.99
Matching Familiar Figures Test:	F_{max} = 3.23
Social Knowledge Assessment:	F_{max} = 2.99
Piers-Harris Children's Self-Concept Scale	F_{max} = 2.82
General Information Subtest, Peabody Individual Achievement Test:	F_{max} = 1.86

APPENDIX B

RESULTS OF STRUCTURED INTERVIEW

Structured Interview SLC/IE Teachers

Metropolitan Nashville Public Schools 1980-81

N=15

1. Do you have the same children all day?

   No = 5; Yes = 10

2. How many do you teach in all?

10-3	14-1	38-1
11-2	17-1	41-1
12-1	18-1	44-1
13-2	34-1	

3. For what percentage of the day are your children in classes with nonhandicapped children?

   13%-12 50%-1

   33%-2

4. What subjects are taught in group instruction?

Science-7	Art-3	IE-3
Social Studies-5	Music-1	
Health-2	Language-3	

5. What subjects are taught individually?

   Reading-15
   Math-10
   Spelling-7
   Language-1

6. Texts used to teach reading: (*Indicates special or remedial education)

   Keytext*
   Websters*
   Steck-Vaughn, Mastering Basic Reading Skills*
   Bowmar-Noble, Sports Reading Series*
   Grolier, Reading Attainment System*
   Reader's Digest, RD 2000*
   Point 31*

7. What do you see as the biggest problem in delivering quality instruction?

Lack of appropriate material--6

Differences in ability and other characteristics (age, handicapping condition)--4

Inadequate communication within and between schools--3

Inadequate administrative support at the system level--2

8. What do you see as the "best" thing about special education in the system as a whole?

The children--3

Activities of the Department of Research and Evaluation--3

Reader's Workshop*

Xerox, Pal Paperbacks*

Scholastic, Action Kit*

Developmental Learning Material, Supplementary workbooks*

McGraw-Hill, Sullivan Programmed Reading*
Sullivan Programmed Reading for Adults*

Merrill Linguistic Readers*

Continental Press, Supplementary material

Ginn Basic Readers-5

MacMillan Basic Readers

Harper & Row Basal Readers

Text used to teach mathematics: (*Indicates special education)

Steck-Vaughn, Succeeding in Math*
Working with Numbers*

Holt Basic Math-5

Houghton-Mifflin-Math for Individual Achievement

Spectrum Math Workbooks

Text used to teach spelling: (*Indicates special or remedial education)

Developmental Learning Materials, Sound Foundations*

McGraw-Hill, Basic Goals in Spelling

SRA Spelling Series

Silver-Burdette Basic Spelling Text

Texts used to teach science: (*Indicates special education):

Steck-Vaughn, Know Your World*
Regions of the World*

Harcourt-Brace, Concepts in Science

Merrill, Social Learning Curriculum*

Texts used to teach social studies: (*Indicates special education)

Steck-Vaughn, America's Story*

APPENDIX C

ASSESSMENT OF SOCIAL KNOWLEDGE

1. Tell me three ways a family can become larger or smaller.

2. Tell me the name of a person in your family?

   How old is _____?

   What sex is _____?

   What color skin, hair, and eyes does _____have?

   How tall is _____?

3. Your grandfather is your mother or father's _____.

   Your aunt is your mother or father's _____.

   Your uncle is your mother or father's _____.

   Whose children are your cousin's?_____.

4. What is your address?

5. Name five pieces of furniture in your house.

6. What does nourishment mean?

7. What are the four food groups?

8. What are two things you can do to keep germs from spreading?

9. What should you do if there is an emergency?

10. What does protection mean?

11. Tell me two kinds of clothes that protect you from rain, cold, and bright sunshine?

12. Name three things about a person that make him/her a good friend.

13. Name two things that make a person a good team member.

14. Tell me three things we need other people for.

15. What's a good way to ask for help.

16. What are two bad ways to ask for help?

17. If somebody gives you help you don't need, what is a good way to deal with it?

18. Tell me three things that you notice about a person's appearance.

19. What are the things you use to keep your hair looking nice?

20. What are two things that can happen to people who don't look nice?

21. Tell me three ways to get a message to another person.

22. What will happen if there is a mistake in the address of a letter?

23. If someone calls your house and wants to speak with your mother, but she is not at home, what do you need to find out for your mother?

24. What kinds of things are used to get information to many people?

25. What is used to communicate driving rules?

Administration and Scoring Procedures

Every effort was made to communicate with the children. Questions were rephrased if there were any indication that the child might know the answer if the question were asked differently. The manner of rephrasing was uniform across all subjects with both administrators. The question was asked as it is written. If no scoreable response was given by the child, the question was restated. Examples are:

Question 1. How do you get more people in a family?

Question 4. Where do you live?

Question 9. What do you do if something bad happens?

Question 18. What do you see when you look at a person? What looks nice or not nice?

The restatements reveal the simplicity of the questioning style. With the younger children, such a style was necessary to establish any sense of their knowledge. Administrators were careful to avoid supplying children with the answer. A large number of the children were at a loss as to what sex a member of their family was. If asked, "Is _____ a boy or girl?" they could answer correctly. In order to deal with this, the probe was, "If _____ fills out a registration card or application form and it asks what sex _____ is, what should _____ put?"

The scoring procedures were liberal. An answer which indicated conceptual knowledge was scored at full or partial credit. In an effort to avoid cultural bias, a variety of responses was considered scorable. Examples include, "People leave" in response to question 1, a grandfather is "my mama's boyfriend's daddy" for the first part of question 3., any "prosocial" responses on 15 and 17.

APPENDIX D

QUANTITATIVE DATA

TEST OF THE HIERARCHY OF INDUCTIVE KNOWLEDGE

The Test of the Hierarchy of Inductive Knowledge (THINK) (Smith & Greenberg, in press) is an individual assessment requring subjects to respond verbally to sets of 21.8 x 28.2 cm black and white line drawings. There are three separate sets of pictorial materials relating to different social learning concepts or themes: object substitution (theme 1), dressing appropriately (theme 2), and getting help (theme 3). Each set contains four line drawings depicting problem situations relating to the specific social learning concepts as well as cards representing alternative resolutions to the problem situations. The verbal interview related to the THINK assessment requires the subjects to produce responses based on hierarchical levels of inductive problem solving. That is, subjects must label and describe various elements in the problem card, produce inferences related to the problem, suggest alternative solutions and predict their outcomes, and develop a rule about solving the problem. Finally, subjects are required to produce a generalization based on the specific problems depicted as well as a class of related problems.

Eight students in the SLC class upon which qualitative data were collected were assessed with a revised version of the THINK. A review of their responses to the assessment procedures suggests the following results:

1. As a group, the students were well able to label and describe the problem situations.
2. They produced a high number of inferences related to the identification of the problem.

3. They were notably articulate in identifying the emotional status of the characters depicted. That is, their vocalizations included names of emotions not frequently used by other special education students at similar age levels.

4. In general, the students appeared to be comfortable with the task of evaluating multiple solutions to a problem; they spontaneously considered alternatives and selected a given solution as the best.

5. Lastly, approximately 50% of the responses to the question requiring development of generalization produced an adequate response. That is, these students were able to go beyond the depicted problem situations and develop an abstraction related to a wider class of similar problems. In the remaining instances, students produced specific rules, concretely tied to the problems depicted (Greenberg, Note 1).

REFERENCES

Greenberg, S. Personal communication, July 24, 1981.

Smith, I. L., & Greenberg, S. Instructional research: Assessment of problem-solving based on the inductive teaching strategy. In H. Goldstein (Ed.), Curriculum development for exceptional children. San Francisco: Jossey-Bass, in press.

APPENDIX E

REASONS FOR LEAVING STUDY

Reason	SLC	IE	C
Family moved out of school zone	2	3	4
Child staffed out of special education	1	-	-
Child removed from placement and restaffed into more restricted program	4	-	3
Chronic nonattendance due to accident or familial problems	3	-	-

APPENDIX F

MEMORANDUM TO TEACHERS

George Peabody College for Teachers Appendix F
VANDERBILT UNIVERSITY
NASHVILLE, TENNESSEE 37203 TELEPHONE (615) 322-7311

Department of Special Education • Direct phone 327-8135

March 2, 1981

To: SLC, Participating IE, and Comparison Teachers

From: Jane Hall Jane

Re: Reports of January Testings & Schedule for Final Testing

I'd like to take a chance once more to thank you for your continuing contribution to this project. Without you, there would be no study. Thanks again!

We have finally completed recording and averaging the scores from the January testing. I apologize for the somewhat extended time; if snow didn't get us, flu did. I have included the matrices of scores from children in your class and a list of the average scores for all classes. In this testing, we repeated the PIAT General Information and the Piers-Harris. We added two tests: Matching Familiar Figures (MFFT) and a measure of social knowledge (SK) from the pretests of the SLC. The MFFT measures impulsivity/reflectivity. The child is presented with a booklet. On one page, there is a stimulus picture. On the other, there are six figures which are very similar to the stimulus. The child is given two trials at matching the figures. The time reported on your matrices represents average time per item. One could be fairly safe in saying that most of our children tend to be impulsive. My favorite was the child who, upon seeing the stopwatch, announced, "Ready, Go!" I tried to persuade him that we were not preparing for the special olympics, but he whipped through the MFFT in record time. I didn't even have a prize.

The social knowledge inventory is composed of some very basic information. The total possible points a child could get is 72. For the older kids, this was a very simple task. For many children, it was not. The teacher in me wants to give you the tests so you can teach those who don't know the answers. The researcher begs you to refrain from a vigorous attack on social knowledge that is not a part of your regular program!

In order to complete testing, we will begin in mid-March. We will be repeating all six tests and will, therefore, plan on 2 testing dates. The testing should not take an extensive block of time, but we feel six tests in a day are too much-especially for Judy and me.

I am enclosing an entire testing schedule. If these dates are not acceptable, please notify us and we can alter. I expect changes, but this seemed to be as efficient a way as any.

SLC
Linda Speir-Gebhardt, Apollo
Betty Denney, Cameron
Kat Manier, Cameron
Jacqueline Sternlieb, Haynes
Lisa Shmerling, Rose Park
Tate McKee, Ross

IE
Barbara McGuire, Donelson
Susie Lahti, Donelson Junior
Edith Joyner, Wharton

Comparison
Karen Young-Dupont
Rick Beziat-Ewing Park
Melvin Bell, Head
Beth Ann Campbell, Park Avenue
Becky Griffith, Pennington
Deborah Koonce, Pennington

Dr. Tom Vandever, Research & Evaluation
Dr. Ruth Smith, IE
Drs. Goldstein

APPENDIX G

TEACHER'S LOG SHEET

Teacher's Initials _____ Date _____ M T W TH F

Phase _____ Lesson _____

How long did you work with the SLC? 15 mins 30 mins 45 mins

60 mins 90 mins 120 mins Other _____

What was the approximate time of day?

8 9 10 11 12 1 2 3

How would you rate the over-all lesson?

1	2	3	4	5
Not optimal- The pits	More bad than good	Okay Tolerable Good/bad even mix	More good than bad	Very good- Close to un-believable

Please indicate what you consider contributing factors-

A. Teacher factors (physical/mental health, extra &/or unexpected responsibilities)

B. Individual child-personal problems cause one child to disrupt

C. Group problems-Trouble on bus, in hall, cafeteria, etc.

D. Disruption of schedule-assemblies, pictures, switch schedules

E. Substantive problems-"Teacher error"; problem w/planning; problem with SLC

F. Other _____

Notes: