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STUDENT ACHIEVEMENT AS RELATED TO THE TEACHER ROLE, STUDENT ROLE AND THEIR INTERFACE

by

Orel D. Callahan

A Dissertation Submitted to the Faculty of The Graduate College in partial fulfillment of the Degree of Doctor of Philosophy

Western Michigan University
Kalamazoo, Michigan
December, 1971

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ACKNOWLEDGEMENTS

Research, especially social research, is inevitably dependent for its completion upon the co-operation and efforts of numerous individuals and organizations. Despite their contribution, however, many such contributors remain unknown even to the investigator. In addition, even those known to the investigator frequently consist of categories of people and comprise too lengthy a list for individual recognition. In the former category are all the students and teachers who constituted the subjects of this investigation, the administrators and staff of the Grand Rapids Michigan Public Schools and the administration and staff of Western Michigan University. The latter includes the many excellent teachers in the Department of Sociology at Western Michigan University and my fellow graduate students in the department. I wish to thank all of these individuals and organizations and gladly acknowledge that without their co-operation and effort this research could never have been begun much less completed. We are, indeed, indebted to them.

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Orel D. Callahan

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INTRODUCTION AND PROBLEM STATEMENT

The research reported herein investigated the relationship between early educational success among disadvantaged children - the criterion variable - and the type of role expectations held by teachers for both the student and teacher roles - the predictor variables. Educational success, as we have used it, refers to levels of performance on general I.Q. tests standardized for the early elementary age group - specifically the kindergarten age group. The predictor variables refer to differential priorities - as indicated by differential expectations - attached to theoretically relevant dimensions of the student and teacher roles respectively. In the case of the student role these dimensions, specifically, are physical maturation development, social adjustment, attitude development, and academic behavioral skills development. In the case of the teacher role these dimensions, specifically, are teacher as facilitator and administrator of natural child development as opposed to teacher as intervener in and modifier of child behavior development. The specific research objective of the investigation was to assess the degree of association between various patterns of role expectational emphasis or priorities among teachers for both the student role and the teacher role and the levels of academic success achieved by their students.

The pragmatic and theoretical justification for such research derives from the fact that early educational experience is a particularly important factor in children's lives and, therefore, important to society. The early educational experience marks the formal beginning of the acquisition
of foundation skills in reading, writing, and other communications arts requisite for future profitable participation in education. Further, these years mark the beginning of formal, structured exposure to a common socio-cultural tradition and history that will, presumably, lead to the development of a value system and cultural tradition sufficiently coherent and shared to promote the continuation of the sponsoring system itself - society. Clearly, the success of early education is of manifest importance to society since the stakes, in terms of realization of future goals and objectives and, indeed, the continuation of society itself, are very high. The importance to society of the realization of the goals of early education as an increasingly important element in socialization provides ample pragmatic justification for the expenditure of research effort and resources in an effort to try and determine just which factors contribute to various degrees of success. The pragmatic justification, however, is no greater than the theoretical; for, formal education is, during the preschool/kindergarten stage, in its most embryonic state. This provides a unique research opportunity to study both the learning process and the differential impact of variables on learning at a time and under circumstances where the least amount of individual differences due to different educational histories are operative on educational activities. Thus, on both pragmatic and theoretical ground, studies of academic success at the early elementary level are both justified and desirable.

In view of the considerable importance of early education it might be assumed that this period would have received considerable research attention. Surprisingly this has not, until recent years, been the case.
As recently as 1965 David E. Lavin, in an extensive theoretical analysis and review of research dealing with academic performance and its prediction, cites only two studies out of nearly 300 citations that are specifically concerned with elementary education. This does not mean, of course, that elementary age students did not appear in any of the samples of the other studies; but their age and school level were incidental to other criteria. Nor does this mean that elementary education has never been studied except in the two studies cited. It is clear, however, that studies of those school years have, at least until recent years, been disproportionately few compared to their potential relevance and contribution.

Fortunately, this situation is changing for several reasons. For one thing, all of the behavioral sciences are conducting increasing amounts of research in educational settings. If this were the only factor operating we could expect an increase in the absolute number, if not proportion, of studies of the many dimensions of early education.

There is, however, another very important factor operating that has led to an increase in the proportion of studies of early education specifically. This factor is the emergence of compensatory education for disadvantaged children. Not all compensatory education, of course, occurs on the early elementary level. Programs such as Upward Bound and Job Corps illustrate this; nevertheless, the compensatory program which most people are most aware of and most accept and which holds the most promise, theoretically, is an early elementary program - Headstart. Compensatory programs have

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the objective of providing the disadvantaged with experiences that will, presumably, put them on an equal footing with the non-disadvantaged. Since these programs already involve the deliberate manipulation of presumed key variables in the learning experience, we consider them a logical place to conduct our research into the effects of the variable of teacher expectations. A closer look at the premises underlying compensatory programs and their objectives will clarify and amplify the reasons for this position.

Compensatory education programs are based on two very basic premises that do not vary regardless of the content of the programs. The first, and most general, holds that human behavior is strongly influenced by individual experience in environmental settings. In other words, individual behavior is not genetically predetermined and any observed behavioral pattern in an individual could have been different given different life experiences, opportunities, etc... This fundamental premise, of course, underlies many, if not all, of the modern behavioral sciences. The second premise holds that there are common, systematic differences that are meaningful in the life experiences of identifiable groups of people. This implies that for larger numbers of individuals there are life experiences and patterns so similar that the individuals acquire similarities of behavior and characteristics that constitute them as an identifiable group. It further suggests that these identifying characteristics are of a nature that has a meaningful impact on the lives and opportunities of members of the group. Given these basic premises, the basic or general labels "disadvantaged" and "compensatory education" can take on specific meaning.
The disadvantaged are an identifiable group on the basis of several criteria such as family income, social class, attained education level of parents, housing, etc., these people are, at one and the same time, similar to each other and different from other groups. These basic differences, further, lead to additional differences in behaviors, characteristics, and abilities widely valued by society in general. Further differences in the above mentioned criteria will, theoretically, lead to systematic variations in individuals that have a meaningful impact on their educational opportunities and potential to use existing opportunities. Specifically, it is thought that disadvantaged children: 1) are exposed to cultural, environmental stimuli in the form of books, magazines, media symbols, etc., less than their middle-class peers, 2) are less advanced in terms of readiness for school as a result of stimulus deprivation, 3) come from backgrounds with historically inferior educational and occupational opportunities, which results in lower educational and occupational aspirations, 4) come from family backgrounds and value systems which place less emphasis in educational success and see education as less relevant to life-chances, 5) are products of child-rearing practices that promote either low or unrealistic achievement motivation, and 6) are socialized to question the motives, credibility, and legitimacy of the educational system and its members. By definition, disadvantaged children are a minority group since such characteristics are atypical of the majority of societies children. It is basic to compensatory programs that it is believed that is both feasible and desirable to provide enrichment and remedial experiences for disadvantaged children that will alleviate their educational deficiencies and, thereby, alter their educational behavior in ways that will enhance their opportunities.
The contention that there is an identifiable group has considerable empirical support. Studies of group differences on a wide variety of variables have a long history, and in relatively recent times several studies have given extensive treatment to the field. Authors such as Conant, Coleman, Herriot, and St. John have all discussed various dimensions of the differential allocation of financial, physical, and professional resources to the schools of different groups of people.2 Other authors such as Brookover and Gottlieb and Hansen and Gerstl have extensively discussed the impact that such differential allocation of resources has on educational achievement among the disadvantaged.3 The works mentioned, extensive as they are, represent only a small portion of the empirical data available to support the contention that there are systematic differences between groups in our society. The contention that the conditions producing these differences can be altered, thereby having beneficial impact on the disadvantaged is less easy to support. Certainly it is possible to alter physical conditions but it is less certain that these alterations will produce intended results. Whether, or to what degree, behavioral differences are dependent upon such environmental differences. The other is, providing a positive answer can be made to the above question, whether or to what extent the correct environmental


variables have been selected for manipulation. The answers to either of these two questions can only be inferred by evaluation of actual attempts to implement programs intended to alter or manipulate the environment of the disadvantaged - in other words - evaluation of compensatory programs.

In recent years agencies of the federal government have provided both the major impetus and funding for compensatory education programs and their evaluation. As our discussion thus far would indicate, the primary reason for their interest and participation has been an effort to enhance the civil rights and opportunities of the disadvantaged minority groups in this country. Because of their central role in originating and funding these programs, federal agencies have had direct access to the evaluations of compensatory programs. In 1967 the United States Commission of Civil Rights conducted a nationwide survey and evaluation of the accomplishments of compensatory programs for the disadvantaged. Using both the Commission's findings and his own research, Arthur R. Jensen has written a comprehensive article that critically reviews and examines current compensatory programs. He begins his article with the statement, "Compensatory education has been tried and it apparently has failed"4 In support of his own conclusion, Jensen quotes a conclusion of the Civil Rights Commission that:

The Commission's analysis does not suggest that compensatory education is incapable of remedying the effects of poverty on the academic achievement of individual children...The fact remains however, that none of the programs appear to have raised significantly

the achievement of participating pupils, as a group, within the period evaluated by the Commission...A principal objective of each (program) was to raise the academic achievement of disadvantaged children. Judged by this standard the programs did not show evidence of much success.5

This finding by the Commission certainly seems to support Jensen's contention that the programs have failed. The findings do not, however, support Jensen's interpretation of why the programs failed.

Jensen contends that the compensatory programs failed to eliminate the visible differences between the disadvantaged and affluent because of genetic differences between the groups that are not responsive to change by the stimuli of compensatory programs. Jensen's explanation of program failure by-passes the possibility of inadequacies of program content and implementation and strikes directly at the very premises that underly the programs. This type of explanation seems unsatisfactory to us. Even if correct, it is premature to accept such a position too readily and, secondly, there seems to be little or no justification for accepting such an extreme explanation with its attendant implications when other explanatory models with greater empirical support and plausability are available.

First of all we must take into consideration that, historically, attempts to implement scientific theory, either physical or social, seldom meet with total success on initial attempts. Theory is, after all, theory; and the attempted validation of its premises and postulates through research and/or pragmatic application invariably leads to modification and improvement of the theory. In this instance, in addition, there is considerable accumulated research findings that contradict Jensen's position and these findings cannot and should not be easily discounted.

5Ibid.
Since we are, in this investigation, primarily concerned with education and some of the related issues attendant to it, we shall look carefully at research findings relevant to education. Intelligence or I.Q., for instance, has obvious educational implications (In addition, studies of intelligence have a long history of comparison of minority groups with the rest of society). It is sometimes claimed that minority groups - either racial or cultural - are intellectually inferior to the rest of society by virtue of their genetic composition. These contentions, as in statements that "all studies point to the presence of some difference between Negroes and Whites as determined by intelligence tests..." are in accord with Jensen's explanation of the apparent failure of compensatory education. Howard H. Long, however, has questioned the way in which sociocultural variables - the key issues in compensatory education - have been controlled for in the reviews of studies of minority group intelligence. His criticisms take on particular relevance when considered in the context of studies of intelligence that do investigate the impact of socio-cultural variables. In studies by Klineberg, Dreger & Miller, and the United States military services it has been shown that group variations in intelligence are far more clearly related to social class than to any racial, or ethnic criteria.

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7Bell, Ibid., p. 318


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The intelligence test scores of lower class blacks and whites are more similar to each other, in other words, than they are to the scores of either black or white middle-class individuals. Findings such as these all tend to confirm the premise that socio-cultural, environmental variables, rather than the genetic ones claimed by Jensen, are primarily responsible for observed differences in intelligence and performance. In the area of motivation, also very relevant to educational achievement and performance, we again find that research findings indicate that socio-cultural values, norms, etc., are related to group differences more than any genetic criteria.\(^\text{11}\) Intelligence, motivation, aspirations, etc., are all recognized as critically important dimensions of the structure of variables contributing to educational achievement. In view, then, of the accumulated research findings, in cases other than compensatory education evaluation, that these are not genetic variables but, rather, that they are sociocultural variables, it seems unwarranted to explain the apparent failure of compensatory programs on the basis of genetic criteria.

Instead, it seems to us that the problem has been one of manipulation of the learning process and its attendant, theoretically relevant variables. This, further, suggests that we should turn our attention to the content and implementation variables of compensatory education programs and stipulate that our major problem area or set of research questions must be directed towards achieving greater understanding of the impact of the theoretically

\(^{\text{11}}\) There is a great deal of research in this area but for comprehensive treatment of the topic see McClelland, D., \textit{The Achieving Society}, Van Nostrand, 1961 or for more focused treatment, Stephenson, R., "Mobility Orientation & Stratification of 1,000 9th. Graders", ASR, April 1967 pp 204-12 & Straus, M., "Deferred Gratification, Social Class, & The Achievement Syndrome," ASR, June, 1962, pp 326-35
relevant variables in the learning process. Since there are fewer potentially confounding variables at the early elementary level than any other, the Head-start type of compensatory programs should be a fruitful area to apply our resources either as researchers or as pragmatic implementers of theory in actual educational settings. There are other reasons, already alluded to or discussed that can be emphasized as justifying the focusing of our attention on early elementary years and compensatory programs in particular. First, early elementary years allow us to study formal learning and the variables that influence it in an embryonic state when the learning process is least complex. Secondly, compensatory programs are particularly suited to research since they are consciously and deliberately involved in the manipulation and control of those variables which are theoretically crucial in learning. The degree of experimental control which can be exercised, while less than perfect, is still usually greater than we could expect to obtain under any other circumstances.

As one class of potential educational studies we feel there is ample theoretical and pragmatic utility associated with early elementary and compensatory programs to justify research in the area. As a specific research topic there are an extensive number of variables that may be related to educational success at this level. It is to be expected that initial compensatory programs have over-emphasized some variables, under-emphasized others, and totally ignored some others. Any number of individual practices, assumptions, or features of compensatory programs to date might account for their reported lack of success. Further, it could be a combination of many factors, which is in recognition of the fact that causation, if it exists, can be a function of the interactive effects of combinations of variables.
rather than linear one to one relationships. In other words, we do not disagree with the basic premise that academic achievement and/or IQ can be improved through compensatory programs. It remains a question for research to determine just which factors or combinations of compensatory program factors are of critical importance to the success or failure of compensatory programs. Our problem was to attempt to assess the contribution to success or failure made by a specific set of variables (teacher expectations for the student and teacher roles) in a compensatory education program.

Of the many potentially relevant variable sets associated with degree of educational success - such as family background, curriculum content, etc., - we have selected a particular dimension of teacher behavior as a focal point for this investigation. This dimension, specifically, is the structure of expectational priorities held by teachers for both students in the student role and for self in the teacher role. The over-all saliency of the teacher as a variable in education is, of course, more or less self-evident. They are, to varying degrees, the selectors, preparers, interpreters, and presenters of the materials which children are expected to learn. In addition, they are the primary focal point for classroom interaction and a characteristic of the educational process commonly shared, though perhaps differentially experienced, by all the children in a given classroom. In view of the central role of teachers it is not surprising that many of their characteristics have already been the subject of research over the years.

For example - Lavin, Op Cit., p 37
Despite the wide range of characteristics or variables studied in these prior investigations, however, there are certain recurrent similarities that have a bearing on both our selection of variables and the theoretical perspective selected to structure the investigation of those variables. Before going on, in the subsequent chapter, to an explicit discussion of our own variables and theoretical perspective, then, it is necessary to consider a representative selection of prior studies. The consideration of these will clarify the background of our perspective and its particular application to the problem of the success of compensatory education.

Education's generic relationship to socialization establishes a logical relevance of educational studies to sociology. Durkheim, considered by many to be the father of modern Sociology, stated that he considered education, "to be something essentially social in character, in its origins and its functions, and that as a result the theory of education relates more clearly to sociology than to any other science."\(^{13}\) Despite this early recognition of the relationship between education and sociology there has, until recently, been a relative back of sociological research into particular dimensions of education that seem potentially fruitful for the application of sociological theory and methods. This has especially been the case with reference to the study of the correlates of academic achievement. Although Lavin cites nearly 200 studies of the sociological correlates of academic success, only three occurred before 1950 and none of those three before 1940.\(^{14}\) Further, among those studies cited, less than ten occurred

\(^{13}\)Durkheim, E., *Education and Society*, Free Press, New York, 1956
\(^{14}\)Lavin, Op Cit., pp 150 -56

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before 1955. It is, of course, to be expected that a critical review of literature and research would tend to concentrate on the most recent advancements in a field. A review of research journals in both sociology and education in the years prior to 1955, however, reveals a similar sort of involvement of either sociologists or the sociological perspective in educational research. Further indication of sociologists belated entry into an educational research is provided by the fact that a special interest section in "The Social Context of Education" was not created in the American Educational Research Association until 1967 and an official division of the same category was not created until 1969. It seems clear, therefore, that while there may be a history of studies of teachers as variables in the learning environment, there is no long standing tradition of studying teacher impact from a sociological perspective.

The perspectives that have provided the organizing framework for most investigations of teacher effects are education, itself, and psychology. The combination of these two perspectives and their own unique individual characteristics has, over the years, tended to produce a succession of studies which, though they differ on substantive content, have important similarities - at least in terms of the problems of this research. The nature of this similarity is succinctly summarized by Leslie Wehling and W. W. Charters Jr. in a recent report of their research into teacher beliefs. They state, "studies of teacher orientation to the classroom situation usually concentrate on one of a few pre-conceived attitudinal dimensions..." In their study they were interested,"...in the departure from the notion that the maximum explanatory power is attained from variations along a single continuum -
autocratic versus democratic, pupil-centered versus teacher-centered, and the like."\textsuperscript{15} The situation they describe has a logical etiology. Personality types, their development, and effects in differing situations are, after all, an important sub-field of study in psychology. It is not at all surprising, therefore, to note that over the years many studies of teachers have focused on such "variations on a single (personality) continuum. Such studies as Wickmans (1928)\textsuperscript{15}, called by Baller and Charles, "A classic in psychology"\textsuperscript{17}, investigated teacher beliefs and attitudes about desirable and undesirable student behavior. A classic study by Lewin, Lippitt, & White (1939)\textsuperscript{18} did deal with the authoritarian versus democratic teacher and their respective effects on learning. Another study by Anderson (1943)\textsuperscript{19} dealt with the di-


\textsuperscript{16}Wickman, E. K., Children's Behavior and Teacher Attitudes, New York: The Commonwealth Fund, 1928


ferent learning outcomes associated with dominative versus integrative teacher leadership. Other studies have investigated the teacher controlled classroom versus the group controlled classroom (Cunningham, 1951)\textsuperscript{20}, and the non-leadership teacher versus the leading teacher (Cantor, 1953)\textsuperscript{21}. From the perspective of education we observe a similar type of interest and category of resultant research. In this case, however, the variable of concern is not teacher personality types but teacher instructional practices.

Guetzkow (1954)\textsuperscript{22}, for example, investigated three methods of teaching – recitation drill, group discussion, and tutorial study - Rasmussen (1956)\textsuperscript{23} instructor versus student centered approaches, Nachman and Opochinsky (1958)\textsuperscript{24} large versus small class sizes, Faw (1957)\textsuperscript{25} instructor centered versus client centered non-directive teaching, Russell (1933) and Erickson & King

\begin{itemize}
\item \textsuperscript{20}Cunningham, R., \textit{Group Behavior of Boys and Girls}, New York: Bureau of Publications, Teachers College, Columbia University, 1951
\item \textsuperscript{21}Cantor, N., \textit{Dynamics of Learning}, Henry Stewart Inc., Buffalo, New York, 1961
\item \textsuperscript{22}Guetzkow, H., Kelly, E. L., and McKeachie, W. J., "An Experimental Comparison of Recitation, Discussion and Tutorial Methods in College Teaching," \textit{Journal of Educational Psychology}, 1954 (No. 45)
\item \textsuperscript{23}Rasmussen, G. R., "An Evaluation of a Student-Centered and Instructor-Centered Method of Conducting a Graduate Course in Education" \textit{Journal of Educational Psychology}, 1956 (No. 47) pp 449 - 461
\item \textsuperscript{24}Nachman, M. & Opochinsky, S., "The Effects of Different Teaching Methods: A Methodological Study" \textit{Journal of Educational Psychology}, 1958 (No. 49) pp 245 - 249
\item \textsuperscript{25}Faw, V., "Learning to Deal with Stress Situations" \textit{Journal of Educational Psychology}, 1957 (No. 48) pp 135 - 144
\end{itemize}
visual versus oral presentation of material, Greene (1928) and Corey (1934) the relative merits of lecture versus reading, Spence (1928), Remmers (1934), Cook (1923), and Watson (1953) the relative merits of lecture versus class discussion, Yoakam (1928) and Goad (1926) the relative efficiency of reading study material one or more times, and finally - Loats (1942) the merits of showing educational films one or two times. The listing of studies by psychologists and educators presented above is, of course, only a partial one. It does not begin to exhaust the

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27 Greene, E. B., "The relative effectiveness of Lecture and individual reading as Methods of College Teaching" Genetic Psychology Monographs, 1928 (No. 4) pp 457-463 & Corey, S. M., "Learning from Lectures vs Learning from Readings", Journal of Educational Psychology, 1934 (No. 23) pp 459-470


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possible inventory of reports of conducted research involving some dimension of teacher characteristics or methods. The listing is adequate, however, to illustrate an underlying methodological similarity that persists in spite of the wide substantive variability.

This similarity is the recurrence of two things: 1) a tendency to investigate "variations on a single continuum" as though there were a linear one-to-one relationships between such a continuum's values and a dependent variable and 2) the recurring usage of an empirical-inductive approach. The first point does not concern us greatly in this investigation. The relative youth of the behavioral disciplines leads us to expect, though not admire, the necessity for single variable studies - particularly at time periods covered by many of the cited studies. Multi-variate research and analysis is actually proceeding almost faster than techniques to conduct it can be devised. The implications of the second point, however, bear careful consideration.

Recalling some of the variables in the studies cited above - authoritarian vs democratic, visual vs audio stimuli, etc., - it is apparent that many of the variables share the trait of being phenomenologically derivable on a "common sense", non-theoretical level. This does not imply, of course, that such phenomena and their study are incapable of being either incorporated into or providing the basis for a theoretical framework. The authoritarian/democratic distinction has, in fact, provided the basis for extensive theoretical development in some areas of application such as the study of deviant behavior. In other areas of application such as the study of teacher beliefs and methods this has not necessarily been the case. Since they are phenomena that exist within the range of everyday observation, potentially independent of and not necessarily requiring a special theoretical perspective to be noticed or identified, there has been a recurring tendency to utilize the empirical- in-
ductive approach. The classical scientific method, however, suggests that research should involve proceeding, deductively, from a general, theoretical framework to testable hypothesis about real events. In actual practice, of course, a good deal of empirical observation and organization of observations usually leads inductively, to the formulation of such general theory. In the case of research involving teacher beliefs and methods it would seem that much, if not most, of the research has been of the empirical-inductive approach centering on readily observable phenomena with a "common sense" potential relevance. If the predictable sequence of events occurred, the next stop in such teacher research should be the inductive formulation of specific theories about teacher impact in the classroom. Unfortunately, to date, there seems to be no such theory formulated. This is not to suggest, of course, that there are no formal theories of learning. In a review of psychological interpretations of learning, for instance, Hill discusses the cognitive-connectionist theories of Watson and Guthrie, the behavioristic-connectionist tradition of Skinner, Thorndike, and Miller, and the cognitive-gestalt traditions of Lewin and Tolman. In the field of education itself, of course, there are the classical developmentalist theories of Piaget. The point is, all of these theories are concerned with the physical act of learning as it occurs among individuals - what the individual sees, how he sees it, when he sees it, the effect of different chronologies and/or types of re-enforcement. These

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theories only indirectly concern themselves with learning as a total system involving individual, environment, others, etc., and, therefore, they do not include a conceptual framework for organizing research into the potential impact of non-individualistic elements in individual learning. In other words, none of them deal with learning as a socialization process and system whose understanding would require a sociological, theoretical perspective or framework, as well as a psychological perspective on individual learning dynamics. As a consequence, in addition to our specific problem of attempting to assess what contribution teacher expectation for students and self make to the success or failure of compensatory education programs, we also have the more general problem of trying to articulate a sociological perspective that will theoretically stipulate why or how such teacher impact occurs.

Our investigation, then, explores, as stated in the introductory paragraph, the impact of teacher expectations on adequacy of acquisition of the student role. This variable's apparent potential importance in early education and, therefore, compensatory education establishes, we feel, the pragmatic relevance and justification of the problem we set out to investigate. In the next chapter we shall also address ourselves to the general problem of trying to show, theoretically, why we feel this class of variables is so important. In so doing, we also hope to take a step toward articulating a partial theory of the social, social-psychological dynamics of learning from a "role" perspective. In view of the discussion above about multi-variate studies it may seem inconsistent at this point to restrict the number of variables we have in-

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vestigated. However, there are two reasons. In the first place we cite the frequently mentioned problem in behavioral research of limited time and resources. Secondly, we are fortunate in that we are able to augment the findings of this investigation with those of a prior study of the same children. The findings of this study deal with many of the variables which we lacked the opportunity to study. Though we will further specify the findings of this larger study, which provides a context for the present research, in later chapters, we can say at this time that its results supported our contention that compensatory programs can be successful and, thereby, comprised part of the rationale and encouraged us to expend energy and time to carry out this research.


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REVIEW OF LITERATURE AND THEORETICAL FRAMEWORK

Conceptual Objectives

The conceptual objective/s of this chapter can be subdivided into three distinct, though highly related, parts. Initially we will briefly review categories of educational research which have involved, in some way, expectations. As this review will indicate, utilization of expectations in research has ranged from situations where expectations constituted nothing more than a very indirect, implicit background perspective up to and through explicit stipulation of expectations as central, independent variables. Secondly, we will turn to the development of a theoretical perspective that will, hopefully, clarify and stipulate dimensions of the relationship between expectations and behavioral outcomes. The theoretical perspective which we will be developing as potentially explanatory of the relationship between expectations and behavioral outcomes is so-called "role-theory" - or at least one tradition of it. Finally, we will apply this perspective to the problem of low academic achievement among disadvantaged children in compensatory education programs and follow by stating a series of research objectives in the form of hypothesis.

Research in Expectations

An early and extensive tradition of research which, it seems to us, implicitly included expectations as a background perspective is illustrated...
by the many studies of teacher attitude and behavior cited in the previous chapter. The supposition that teacher attitudes and behavior are not random - common to all such studies - demands a conceptualization of structural expectations held by the role taker and/or those he interacts with. Few, if any, of those investigations stated such an involved chain of logic which connected their variables to any underlying expectational structure; but such a connection is logically implicit. We may suggest now (with a promise to elaborate the point below) that much of the inconsistency in the results of these studies may stem from the failure to employ systematic theory in regard to expectations.

Coming closer to an explicit consideration of the role of expectations is the tradition of research focusing on the effects of parental attitudes, aspirations, etc., in student behavior and achievement. Typical are those which investigate the expectations and/or expectational priorities which American parents hold for education as an institution. In other words, what may one reasonably expect from and hope for as an outcome of children being educated. Survey's such as those conducted by the National Opinion Research Center and by Elmo Roper indicate considerable variability among parents with respect to expectational emphasis regarding such alternate functions for education as vocational training, basic skill training,

34 "The Public Looks at Education" Report No. 21 (National Opinion Research Center of Denver 1944

cultural value transmission, social adjustment, social mobility, social change
instrument, etc. Such surveys, of course, have not attempted to show any
direct correlation between these sorts of expectations and student behavior.
Implicitly, however, some impact or relationship must have been assumed or
else there would have been little point in or rational for conducting the
surveys. Investigations such as those typified by Joseph Kahl's study of
"Common Man" boys are more direct in their propositions of relationships
between expectations and behavioral outcomes. Kahl found, for instance,
that a relationship did exist between the occupational and educational as­
pirations of boys and the aspirations of their parents for them.36 Aspira­
tions, admittedly, are in no sense completely equivalent with expectations;
but aspirations do, again implicitly, suggest a set of expectations concern­
ing both the adequacy of means available to achieve aspirations and the prob­
ability of actually fulfilling those aspirations. Kahl's study, as stated
above, is only one of a long tradition of studies that have dealt with myriad
dimensions of family characteristics as background correlates of student be­
havior. Such a tradition of studies, as contrasted to their specific find­
ings, is germane in this instance by virtue of their demonstration that such
things as differential class backgrounds, aspirations, values, etc., are
associated with variable behavioral outcomes; and, further, because, in our
view, such variables are implicitly related to an underlying structure of ex­
pectations. For those with more specialized interests in specific research

36Kahl, J. A., "Educational and Occupational Aspirations of 'Common Man'

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findings and/or conclusions regarding the effects of specific parental or familiar variables, there are several good sources of summary reviews. Such summary statements may be found in Brookover and Gottlieb, Lavin, Herriot and St. John, Charters and Gage, and Paris\(^{37}\), to cite only a few.

The degree of explicitness relative to use of expectations as variables increases slightly in the area of studies of student–teacher relationships. By far the greatest number of these have tended to focus not on expectations, but, rather, perceptions of expectations. Studies of significant others, as illustrated by Coleman's Adolescent Society,\(^{38}\) have investigated the relative saliency of expectational sources. Studies such as the one by Gross, et al have investigated the effects of conflicting expectations and/or perceptions of expectations.\(^{39}\) One of the most extensive traditions investigating perceptions of expectations, valuations, etc., is the one studying self-concept. In this area the work by Brookover and various associates is most extensive.\(^{40}\) Coleman's study and others with similar objectives have certainly


indicated that there is variation in the saliency of expectational sources; and this, in turn, suggests that while expectations themselves are salient variables so, also, are their sources as correlates of variations in behavioral outcomes. Similarly, the work by Gross et al on the one hand, and Brookover et al on the other, indicates that either conflicting expectations or perceived content of expectations respectively may be correlates of variations in behavioral outcomes. While these researchs are explicit in their theoretical treatment of expectations as a class of variable, they still do not focus on expectations as the primary variable in their studies.

The final transition to a truly explicit level of consideration of expectations as related to academic achievement of students is achieved in the recent studies by Rosenthal and his associates. Their work specifically focused upon expectations as variables associated with variations in behavioral outcomes. Rosenthal specifically studied expectations of individual classroom teachers rather than perceived expectations. His results strongly suggest that teacher expectations for student behavior are a powerful variable in actual, behavioral outcomes among students. He found, for instance that structuring teacher expectations to expect academic "blooming" from certain students resulted in significantly higher levels of achievement on the part of these students. More than any other studies of which we are aware, these explicitly emphasized expectations as the major independent variable. They did so after stating hypothetical relationships between ex-

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pectations and behavioral outcomes in the form of research hypotheses with a strong potential for falsification. In a very real sense this study is both a culmination and a starting point in the task of determining the relevancy of teacher expectations to variations in student achievement or behavior in general.

Rosenthal's studies represent a plateau or level of explicitness relative to the study of expectations that had conceptual roots in earlier, less explicit traditions. In that sense, they are a culmination of a tradition of expectational studies. They represent a starting point in that they are already generating an impetus to additional research in an area whose conceptual surface has barely been scratched. Where Rosenthal, for instance, investigated the effect of manipulating one dimension of a teacher's expectational structure, others such as Meichenbaum and Bowers have studied both actual expectations and manipulated expectations. In both of these instances, it is clear that only a limited number of the dimensions defining an expectational structure, as it relates to student behavior, are being studied. Illustrative of the potential for other areas of investigation is the study by Soles concerning relationships between teacher expectations and internal school organization. Soles found that degree of teacher satisfaction with job was related to the degree of correspondence between their expectations for school organization and the actual


organization of the school they taught in. The point, of course, is that there is a tremendous potential for investigation of diverse phenomena using a perspective that explicitly stipulates the dynamics of expectations and how they may be expected to affect behavior. This clarifies our contention that Rosenthal's work is both a culmination and a starting point. While it is culminative with reference to explicitness of consideration of expectations as a variable, it only begins to suggest the wide range of potential application of the conceptual implications of expectations considered as variables. As such studies proliferate it will become increasingly important to insure that there is a theoretical, conceptual framework that will facilitate both the identification of potentially fruitful research questions and the interpretation of the results of completed research. Stipulation of such a theoretical perspective is our next conceptual objective.

Theoretical framework

Development of an original, comprehensive theoretical perspective would, if it were necessary, be a formidable task. It is fortunate, therefore, that it is not necessary. An existing perspective already includes, as an integral component, consideration and theoretical stipulation of the presumed relationship between expectations of an expectational source and behavioral outcomes in individuals who refer to that source. As we have already suggested, this is the perspective frequently referred to as "role-theory", although it is more properly conceived of as a conceptual model since it can be used or subsumed under several general theoretical perspectives such as structural-functionalism or symbolic interactionism. As a compromise between the ambitious implications

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of using the phrase "role-theory" and the prospect of repetitive usage of the awkward phraseology "conceptual role model" we will adopt, for the remainder of this paper, the phrase "role-perspective."

Our general orientation to the role-perspective is based on the position originally articulated by Ralph Linton. Linton proposed a dual relationship between status which, "...is simply a collection of rights and duties..." and "...a role (which) represents the dynamic aspect of a status...When he (an individual) puts the rights and duties which constitute the status into effect, he is performing a role." This orientation is basic to many modern sociologists. As Biddle and Thomas have stated, "Linton's ideas were...influential. His insistence upon a close relationship between role and position has been followed by most modern writers on role." Most sociologists have, in fact, followed this basic perspective over the years, but this has not prevented the development of alternative modes of conceptualization and resulting implementation of the basic idea. With reference to the conceptual and research objectives of this investigation one such set of alternative conceptual developments is central.

Within Linton's basic perspective there is a clear implication that "role" refers to the dynamic, behavioral dimension of the status role combination. Over the years, however, two alternative conceptualizations have arisen as to

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44 Linton, R., The Study of Man, Appleton-Century, New York, 1936 pp 113-14


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which behaviors or which levels of behavior actually define the analytic unit-role. A review of the conceptual positions of these two traditions is found in Robin's article discussing "Three Approaches to Role-Theory". Summarizing that portion of the discussion relevant to our own conceptual and research objectives, these two traditions are: 1) role is defined as those behaviors performed in conjunction with a status, and 2) role is defined in terms of the expectations for appropriate behavior associated with a status that are held by role-audiences or role-definers. Considering our interest in the relationship between expectations and behavioral outcomes, the latter tradition would seem most appropriate to this investigation. It is clear, however, that its apparent appropriateness is relatively meaningless unless the tradition itself can be shown, conceptually, to be the most useful one for analyzing role. Consideration of this question requires us to contrast the two traditions in greater detail. Such a contrast will, we believe, achieve greatest clarity if we consider certain topics from a very fundamental perspective. In the immediately following sections we will consider, in order of treatment: 1) general premises about behavior, 2) personality as a concept descriptive of a basic level of behavioral organization, 3) the relationship between personality and role with role considered as another concept descriptive of a level of behavioral organization that is qualitatively different from personality, and 4) finally, learning and evaluation as these activities can clarify the relationship between actual behavior in a role - role performance - and expectations for role-behavior.

The behavioral sciences are, by definition, interested in behavior. Their interest, however, is not unqualified. One, they restrict their interest, depending on their boundaries, to specific levels and manifestations of behavior. Two, their interest is founded on the related, dual premises that behavior is both organized and learned. Discrete acts of physical or cognitive behavior could, of course, be taken as specific units of analysis and analyzed in terms of physiological energy expenditure. From the former premise stated above, however, it is clear that behavioral scientists are more interested in behavior's meaningful content relative to a total system of culturally, patterned behavior. Behavioral scientists observe this orderly, systematic behavior and interpret its implications from the perspective of organizing theoretical or conceptual frameworks. A basic facet of most such frameworks is the latter premise cited above—that behavior is learned. To assume otherwise, while still accepting the premise of organization, would be to suggest that observed behavioral organization is a product of inherent genetic patterns which the individual actualizes and emits. This, of course, is a position not unlike Jensen's. In such a case the proper study of behavioral order and regularity would be restricted to one of two units of analysis—either the individual or the species gene pool. Instead, of course, most investigators accept the premise of the central role of learning in human behavioral outcomes. This point is very significant and the reader is advised that important implications of it will be considered in more detail as we continue this discussion.

The most basic level of behavior which both concerns behavioral scientists
and reflects this dual characteristic of learned organization is the personality system of the individual. In their introductory sociology text, Horton and Hunt have defined personality as "a behavioral tendency system".\footnote{Horton, P. and Hunt, C., Introductory to Sociology, McGraw-Hill Co., New York, 1968, Chap. 5} Utilization of a definition of a psychological variable from an introductory sociology text is deliberate. Such a definition cuts through the complex, alternative elaborations associated with the more sophisticated levels of definition used by members of different theoretical traditions and highlights the basic areas or points of general agreement. In other words, it reflects what might be termed a lowest common denominator of theoretical agreement. With this in mind we note that, on the one hand, this definition incorporates the position that behavior is systematic or organized. On the other hand it indicates that behavior, as organized on the personality level, is a system of tendencies rather than a realized, unvarying, finished product. One implication of this is that personality is learned. Rather than a system of pre-determined responses to categories of stimuli, this position suggests that the system of behavior is composed of tendencies which are, by implication, modifiable and responsive to the content and meaning of stimuli. Differently phrased it means that the personality system is modifiable (though it may also be relatively inflexible) rather than genetically pre-determined and incapable of change. This further suggests that actual behavior is an activation or actualization of tendency potentials in response to the content or characteristics of a stimulus situation. Actual behavior by an individual is not only organ-
ized but is, in addition, organized with respect to the particular stimulus content of the situation where it is performed.

The concept of personality has been useful to all the behavioral disciplines in ordering observations and descriptions of behavior systems of individuals. When individuals bring their behavioral repertoire's into interactive situations, however, the concept of personality has not been analytically adequate to the task of organizing observations and explaining the dynamics of what takes place. Even in the case of a "simple" dyadic interaction the level of organization demanded by the situation exceeds and is qualitatively different from anything that can be derived from the individual personality systems. Rarely, if ever for instance, would the total content of a given personality system's potential be appropriate to a given interactive situation. As Thibaut and Kelley have phrased it, "There are many things an individual can do in interaction with another person...each person has a vast repertoire of possible behaviors, any one of which he might produce in interaction."48 While the problem of understanding the basis for the selection of behavioral alternatives is complex, it is only one dimension of the over-all problem of how interactive behavior is ordered and organized with respect to formal situations or social structural exigencies. The role-perspective has been conceptually useful in organizing observations and descriptions of this level of behavioral organization. On another level, however, the role-perspective has attempted to analyze and stipulate the dynamics of

how this level of organization is acquired, structured, and activated and, further, what the consequences are of variations in the dynamics of the process.

The role-perspective in the descriptive, almost taxonomic, mode fits very well with the definitional tradition discussed by Robin as defining role as behavior performed in a status. Lindesmith and Strauss have also described this tradition. They state, "Anthropologists and sociologists... have been interested in communication and the interrelationship of institutions (they) have needed a term to indicate the relation of individual activities to the larger organization of society." A position stated by Parson's sounds similar but has important differences. He states:

"The abstraction of an actor's role from the total system of his personality makes it possible to analyze the articulation of personality with the organization of social systems... the structure of a social system and the functional imperatives for its operation and survival and orderly change as a system are... different from those of personality. The problems of personality and social structure can be treated only if these differences are recognized. Only then can the points of articulation and mutual interdependence be studied."50

The positions reflected in the above statements are similar in that they suggest that the role-perspective is a useful organizing and descriptive framework for dealing with a level of behavioral organization that goes beyond the level defined by personality. The basis for this emphasis on systematic observation is not difficult to understand, but some explicit


consideration of it will clarify the over-all discussion and, specifically, the relationship between personality or individual behavior and role.

Scientific inquiry is always founded in observation of phenomena - in the case of the behavioral sciences the relevant phenomenon or unit of analysis is invariably some level or aspect of behavior. This basic interest, as pointed out earlier, is always underlain by the premise that behavior is orderly and organized. Predictably, therefore, early efforts at theory building often begin with taxonomic, description models that, hopefully, reflect on a conceptual level the order and organization presumed inherent in the unit of analysis. Progress in the development of such models is, however, seriously impeded when there is ambiguity concerning the identity of the unit of analysis itself. The disagreement concerning what constitutes or defines a role is an example of such ambiguity. One contributing factor in producing this ambiguity can be inferred from a statement by Biddle and Thomas. They state that "...the idea that an individual's behavior could be construed as role-performance implied that role was one linkage between individual behavior and social structure." Carefully interpreted, this statement causes no ambiguity since it clearly identifies individual behavior in a role as role-performance rather than role. The latter contention that role may constitute a linkage between individual behavior and social structure, while, very possibly true, has greater potential for promoting ambiguity about the appropriate unit of analysis in studying role. Part of the problem arises from the fact that in-

51Biddle, B., et al, op. cit., p 7
individuals do occupy statuses and individuals do perform the roles associated with statuses. The suggestion that role bridges or links the gap between the individual and social structure may imply that it is the behavior of individuals structured relative to structural status that constitutes the appropriate unit of analysis. Another way of expressing this position would be to state that roles are segments of personality that are brought to bear in statuses. Such identification of individual behavior in a status as the unit of analysis for the study of "role" leads to the attempt to explain or describe the sociological concept "role" in terms of individual or psychological characteristics. This sort of reductionism can be avoided, however, if we recognize, as Parsons stated, that individual behavior and social structure differ and represent qualitatively different levels of behavioral organization. Parsons' position that role enables us to analyze the articulation of personality with the organization of social systems clearly implies that they are separate things rather than the same thing on different levels. This should begin to make clear why individual behavior cannot be construed as the appropriate definitional property of a role either on the descriptive or analytical level. Additional clarification can be obtained by specifically considering the problems to be encountered by observing and describing role from an individual behavior perspective.

Although status and role are, from the sociological perspective, concepts on the sociological, interactive level, individual behavioral systems are relevant to filling statuses and performing roles. It must be kept in mind that while individuals perform roles, they are not necessarily cognizant of the researchers semantic and analytic need to conceptually distinguish between
psychological and sociological levels of behavioral organization. In the performance of roles, individuals inevitably interject purely idiosyncratic, personality characteristics that have no direct relevance to what Parsons called the "functional imperatives" of social system organization. While such idiosyncratic behaviors are obviously present in role behavior they have little relationship to the study of system function and organization on the role level.* From this it can be seen that focusing on individual behavior in a role, even for the limited purposes of observation and description, will lead to including non-relevant items and observing the underlying order and organization presumed present in the phenomena conceptually represented by role. The self-evident rejoinder to this, of course, is that role is structured by norms for behavior and observations and interpretations of role-performance are equally structured by such norms.

This leaves unstipulated, however, the source of the norms. Further, it does not address itself to the more fundamental issue of theoretically stipulating how those norms are communicated to and integrated into the individual and his actual role-performance. Are such norms, for instance, learned by the individual in interaction with the status/role situation or are they simply the activation and implementation of previously learned individual norms that constitute the basic personality system. Accepting the latter would be to suggest that (all over again) the appropriate unit of analysis in investigating

*This is not intended, of course, to suggest that actual role-performance and its effect on a system cannot be a useful unit of analysis. It merely clarifies that such an investigation would, in fact, be dealing with a substantively different unit of analysis than system organization on the role-level.
role and role-performance would be the personality system—a premise which we
have already discussed and rejected. Instead our perspective is that role be-
behavior is learned in interaction with appropriate role-definers and/or audiences
in the setting where the status/role is carried out. Adequacy or form of learn-
ing, of course, would be influenced by the individual role-performers character-
istics that are brought to the situation and therein lies the interdependence
of behavior organized on the personality level and the behavioral organizational
level associated with a status/role. It must be kept in mind that personality
systems are derived from the same basic culture which includes the status/role
being acquired. This suggests, therefore, that there should be nothing system-
atically prohibitive or inhibitive to the learning of norms for a role. Indeed,
ideally the one should be supportive of the other. Where, then, does this leave
us with respect to actual role-performance or behavior?

Behavior is, after all, the thing most easily observed and it is unquestion-
ably a crucial feature of role, though not, from our perspective, definitional
of it. Any alternative conceptual framework to the behavioristic one we have
been discussing must, if it tries to approach an analytical as well as descrip-
tive level, stipulate a place for actual behavior and its relationship to the
dynamic, learned aspect of role. In other words, any proposed alternative must
not simply disregard behavior or else it will be as fallacious as over-emphasis
on behavior. It seems to us that the tradition that defines role on the basis
of expectations, as discussed by Robin and others, offers a framework that can
deal with both actual behavior and the dynamics of role-definition and acquisi-
tion. To clarify this we must digress briefly into a discursive treatment of
learning which is a crucial part of the proposed dynamics of role acquisition and
Learning can be viewed on several different levels and from several different perspectives. From the most fundamental perspective, of course, it is a complex process of internal organismic responses to stimuli. It includes physiological, bio-chemical, electrical, neurological, etc., variables. A fully developed theory of learning would stipulate the types of inter-relationships, interdependencies, and processes connecting these diverse phenomena into a dynamic theory of learning. Unfortunately, these variables and/or processes are difficult to observe and measure and as a result no such desirable catholic theory of learning dynamics on this level exists. Most learning theories, instead, deal with another level of more visible variables.

These variables may be termed external, and they, in turn, can be subdivided into several distinct categories or classes. One class is composed of the external variable behaviors of the learner. These are presumed to be the visible products of the interactive functioning of the less observable and tangible internal processes. These include such behavioral skills as reading, writing, communication, study habits, etc.,. In the case of the individual child these are the behaviors that provide presumptive evidence of the functioning and form of internal learning processes. We may also point out that such behavior on the part of students is congruent with role-performance in the student status.

Another class of behavioral variables revolves around the learner. In addition they also reflect a dimension of teacher behavior. This is behavioral
performance of students on various I. Q. and/or achievement tests. Performance on these tests can be taken, from one perspective, as indicators of the level of student behavioral functioning on both the internal and external dimensions. From another important perspective we suggest that test behavior is used, not to measure performance levels, but to measure the degree of fit between performance levels of students and the expectations for performance of students that are implicit in the content and structure of the test instrument. These expectations, of course, are an expression of a dimension of teacher behavior. This point clarifies the relationship between actual role-performance and role defined from the expectational perspective. Any investigation of role by an outside source on the level of either content description or the level of assessments of appropriateness and/or adequacy must have as a referent some source of norms outside the actual role-performer and his performance. This idea is exemplified by reference to a critique of the role as role-performance position made by Ralph Turner. He states:

The idea of role taking shifts emphasis from the simple process of enacting a prescribed role to devising performance on the basis of an imputed other-role. The actor is not the occupant of a position for which there is a neat set of rules - a culture or set of norms - but a person who must act in the perspective supplied in part by his relationship to others whose actions reflect roles that he must identify. Since the role of alter can only be inferred rather than directly known by ego, testing inferences...is a continuing element in interaction. Hence the tentative character of the individuals own role definition and performance is never wholly suspended.52

( emphasis in the original)

This perspective is congruent with a tradition described on Lindesmith and Strauss which "used 'role' to describe the process of co-operative behavior and communication, Not to illuminate the functioning of institutions." This is a tradition derived from Mead and it indicates the interactive dimension of role and specifies the over-all relationship between role and role-performance. It also suggests another class of variables important to learning outcomes - those external to the learner.

"External variables" is actually a summary concept that includes a wide variety of different variables such as curriculum, physical facilities, family background, teachers, etc. The earlier cited study by Erickson, et al, investigated some of these classes of external variables such as curriculum structure and family background as they effected achievement of disadvantaged children in compensatory programs. It did not, however, formally investigate the impact of teacher expectations. The perspective we have been developing thus far is one that will permit examination of the impact of teacher expectations on student behavior in the dimension of achievement. Specifically, it will enable us to look at student achievement as role-performance and, thereby, introduce teacher expectations as an important variable in studying the adequacy of acquisition of the student role.

The role-perspective and student achievement

Student is the status of concern. We are interested in the degree

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53 Lindesmith and Strauss, op cit., p 277

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of learning success among disadvantaged children since this reflects success in acquiring the role associated with the status of student. In particular, we are concerned with the relationship between teacher expectations and levels of achievement which are indicative of levels of success in role acquisition. Theoretical and/or conceptual rationale for expecting a systematic relationship derives from a tradition of the role-perspective which, in addition to providing a descriptive framework for studying role-performance, also provides a framework that is potentially analytical of the dynamics of role-acquisition and implementation. This is the perspective or tradition that is based on the dual premises that role performance is systematic and learned. From these premises and their implications is derived the proposition that role is defined on the basis of expectations of others rather than actual behavior of status encumbents.

The position that role is most appropriately defined as expectations for behavior just begins to define a perspective for studying role. Once that position is taken there remains the problem of stipulating the structure and dimensions of expectations and how they are imparted to appropriate status encumbents. Fortunately, preliminary theory in this problem area has already been stated and can serve as a starting point for our specific research objectives.

The basic perspective that we have selected as a starting point was developed by S. F. Nadel. He proposed role-definers hold three distinct

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classes of expectations for others. They are: 1) expectations about overt nomative behavior--talking, not talking, punctuality, work habits, etc., 2) attitudinal behavior--eagerness, deference, alertness, etc., 3) and status characteristics--to be a Mother you must be a woman, to be an elementary student you must be a child, and so forth. It is not sufficient, however, to simply subdivide expectations into these classes. Although each of these classes of expectations may be presumed to exist to some degree, it is quite logical to assume that both their relative importance and frequency vary between roles. There are, for instance, more status characteristics associated with the role of President of the United States than there are with the role of student. More significant than this, however, is the potential for variations in the expectations within a role. That is, expectations can vary between roles, such as President and student, but variation can also occur on these points within a single role. Thus, with reference to the student role, teachers, as sources of expectations, may vary in the emphasis or priority they attach to one class of expectations for students while de-emphasizing or ignoring others. Further, role expectations content may not be static. It may vary over time. A teacher might emphasize status characteristics expectations, for instance, for four year olds and ignore behavioral skills because they feel that four years olds are not physically and emotionally developed enough to handle academics. This same teacher might find it very appropriate to emphasize behavioral skills when and only when students are five years old. Thus there are two potential categories of expectational variation within roles. There can, on the one hand, be variations in class of expectations between
audiences for a role and, on the other, a single audience may vary emphasis in classes of expectations over time or situation.

With reference to the role of student, consideration of its content leads us to sub-divide the classes of expectations suggested by Nadel. The period of initial acquisition of the student role coincides with a period of rapid physical and social development in children. This development is closely linked with age-grade development. As such, it corresponds to Nadel's expectational category of status characteristics. That is, expectations for both physical and social development among these children are tied to the attainment of age-grade statuses. The physical development goals and social adjustment development goals are, however, distinguishable. We determined, therefore, to sub-divide Nadel's expectational category based on status characteristics into both physical maturation expectations for students and social adjustment expectations for students. In addition, we will be investigating variations in expectational priorities in attitudinal and skill behavior development.

Most of the research reviewed in the previous chapter and at the beginning of this chapter investigated the effect of single variables on student role-performance or achievement. Although the studies varied considerably in both the variables investigated and the observed correlation of such variables to performance, they do have one thing in common. Their results all attest to the theoretical inadequacy of trying to account for variations in student role performance on the basis of a single variable. In view of this it would be conceptually naive to propose, at this point, that student role performance variations are a direct linear function of yet another
single variable such as variations in role expectations. Both the general research in role performance and the specific research conducted on the student role indicate that performance is a resultant of the complex interaction of many variables whose saliency may vary over time and situation. In our investigation many of these variables and their impact had already been investigated in the previous study by Erickson et al. We were, therefore, able to investigate the impact of expectations without also controlling for or specifically studying these other variables. Despite this opportunity to draw on prior research, however, there was one variable which we felt it necessary to formally investigate in this research. Because of its relationship to the dynamics of expectation communication it is particularly relevant to the intended objectives of this investigation. It is sufficiently relevant that some attempt at conceptual consideration and empirical measurement of its impact on role performance must be included in this study.

To the best of our knowledge this variable has not been investigated previously or ever conceptualized in just the way we intend here. There is, therefore, no existing term to identify it and, obviously, no short way of stipulating its dimensions and content. We propose the term "interface" to identify the variable. Stipulation of its definitional properties will require discussion.

Interface actually has a dual identity. It both refers to the function of a variable segment of a role and to a process denoting the interaction between roles. The first dimension of interface's identity or definition derives from the fact that an individual can be both a role-performer and his own definitional role-audience. This characteristic stems from an individual's
ability to symbolically take self as an object and act as his own role-
audience or source of expectations. Indirectly, then, characteristics of
an individual become a variable component of role-performance to the degree
that these characteristics influence the manner or mode of implementation of
personally held expectations for self in a role. The expected content of
the role and expectations for the carrying out of the role, acquired during
socialization to a role, become important variables in role-performance.
This position, of course, incorporates nothing new into the role-defined as
expectation perspective except, perhaps, an additional expectational source.
Interface, specifically, refers to that segment of the role concerned with
manner or mode of relationship to other roles — particularly as this is
structured by perceived normative content of the other role. In other words,
this dynamic segment of an individual's role has as its expectational referent
not only expectations for ones own role but, in addition, expectations about
relationships with reciprocal roles. Thus, in this dimension of its identity,
interface refers to a variable dynamic segment of role-performance that is not
totally a portion of either ego role or its reciprocals — hence, interface
between roles.

There is, however, another dimension to interface's identity. This dimen-
sion is defined on the basis, not of expectations for self and other roles;
but, rather, on the basis of perceptions by ego of the characteristics of the
prospective role-encumbents of the other role. Particularly as these charac-
teristics are perceived as having a bearing on the appropriate mode or manner
of implementing expectations for self in a role as it relates to alter's role.
Again, interface derives from the fact that actual role-performance, in addition to being based on expectations, is mediated by perceived characteristics of alters and how these characteristics influence alternative modes of implementing expectations for self into role-performance.

This discussion clearly suggests that communication of expectations for the role alter is performing will vary in accordance with expectations for self in own role. Expectations for self in own role are, in turn, influenced by both the perceived characteristics of and expectations for the other role and the perceived characteristics of potential performers of that other role. With alternative modes of implementation of own role and communication of expectations for the role of some alter available to ego, actual behavioral outcomes in alter may vary as the content of expectations for self and perceptions about the other roles and individual's vary. This may be clarified by consideration of the teacher/student role used as an example.

What we have called interface has an expectational dimension. However, it differs, subtly, from role expectations. Role expectations are expectations for a generalized abstraction— the student role for instance— which no concrete individual ever totally embodies. The primary referent of this set of expectations, a general other, is a component of a set of other interacting general components that comprise a system. The expectations held for a role are, themselves, generalizations and, further, ideals whose referent is another ideal generalization, the role whose primary relationship is to the system. The content of these expectations derives, as we have stated, from the theoretical socialization of individual teachers. These teachers, in trying to realize the ideal expectations they hold for the student role, must deal not with abstractions, but real children. Another distinct, though closely related,
dimension of a teacher's characteristics is the acquired set of beliefs, dogmas, and theoretical orientations toward actual children, their characteristics and the effect these characteristics have on the task of attempting to realize, in the children, an approximation of the expectational ideal. In addition to the expectational pattern a teacher holds for the abstract student role, there also exists a separate though related set of goals for actual children. These goals are based on a teacher's acquired perceptions of the characteristics, potential, needs, and capabilities of children in relation to the expectational ideals for the abstract student role. This profile or pattern of beliefs or perceptions a teacher holds about children and their capabilities is a teacher characteristic different from, but closely related to, the teachers expectational profile. This is the sense in which it is possible to look at interface on the basis of a set of teacher characteristics. Interface, however, also has an interactive dimension which, in the final analysis, may be its most distinctive feature for definitional purposes.

To say that interface is an interaction variable is to say that it is a dynamic. This, in fact, is what we are going to try and show - that it is the dynamic linkage between static characteristic sets of teachers (expectations) and the realized outcomes or end products resulting from those expectations when they are activated in the presence of actual children. To illustrate how this dynamic linkage functions, it is necessary to briefly consider the concept of role taking.

Role taking is extensively treated in the literature going back at least to G. H. Mead so it needs only brief review here. Essentially it proposes that in any interaction dyad (or a greater number) the interacting parties
must possess, or believe they possess, knowledge of the content and mode of action of the other role. In planning, or selecting their own behavior they take the role of the other to the extent that they anticipate (with varying degrees of accuracy) the type of response their own potential behavior might elicit. In other words, on a symbolic level each individual is performing both roles. In most instances, of course, this anticipatory symbolic behavior or role taking is not deliberately or consciously undertaken. The sets of beliefs and expectations each member of the dyad has about the other have become part of a repertoire of almost automatic behavioral responses. The degree to which such patterns of interaction have become, so to speak, programmed into each role-encumbent can be taken as an indication of the degree of socialization to and integration of the roles. In an extreme case such as a combat surgical team it may even reach the point where verbal communication is unnecessary. Each role is so attuned to the other that they act almost as a single role with multiple encumbents. This suggests an interesting question. Should we, then, look at the teacher/student dyad as a single role—sort of a super-role such as the socialization role—and merge their content so that the definition of either the student or teacher role included the content of the other? We think not.

The respective roles in a combat surgical team are relatively insulated from all other roles for the period of their performance. In addition there are clearly delineated goals that all members have: 1) been socialized to and 2) have confidence that other members share. In the case of most role complexes, including the teacher/student, this is not the case. A student may
be male or female, black, white, or yellow, rich or poor, Catholic, Protestant, or Jewish, etc. For all of these characteristics teachers will also possess varying sets of beliefs and expectations which enter into their role-taking behavior. To, therefore, include all of this content in the definition of a role would be unworkably cumbersome conceptually. This is why we have proposed the term interface to identify this area intermediate between two or more distinct roles. In effect this is where the content of the two roles and the content of the role performers all merge and then feed back to the respective role performers to effect their performance. Before attempting to summarize this and then develop its implications for the specific teacher/student dyad a few general points need to be made. First of all, this discussion should clarify, a little more, why this investigation's design using only young children is desirable. The number of other characteristics associated with other roles that might be associated with a student by the teacher is greatly limited, thereby reducing the number of role-interfaces. Two, interface is not all in one direction. In a different study with different research questions and correspondingly different design someone might well look at the same dyad from the opposite direction. That is, the effects of student expectations on teacher performance. Some other points need to be made, but they will emerge with more clarity it is felt when we go on to the specific development of the content of the student/teacher interface. Before that, however, a brief summary of the major points in the definition of interface is required.

Teacher expectations for the student role are a teacher characteristic
variable that may affect student role performance. The way those expectations for the general student role are applied to actual children also varies among teachers. The beliefs, attitudes, and expectations a teacher holds about children and how they learn is, then, another variable teacher characteristic. Such belief patterns, however, are not simply static teacher characteristics. They are, rather, indirect indicants of variable types of interaction resulting from role-taking. In other words, part of a teacher's expectations for personal role-performance are structured by symbolically performing the role of the student and anticipating the probable results of alternative modes of personal role behavior. Thus, part of both the perceived content of the student role and the child role enter into the structuring of teacher role performance, but this content is not formally part of the content of the teacher role. This intermediate area of symbolic behavioral interaction is what we have termed interface since it describes a behavioral area where two roles and their content meet without the content of either being formally incorporated into the other. In the most direct sense it is an unobservable interaction variable and is, therefore, difficult to measure. In an indirect sense it is an individual variable characteristic that can be measured and, from this measurement, deductive inference can be made about its probable impact on the other role. To do this, of course, requires consideration of the specific roles under study and the type of teacher characteristics that provide these indirect indicants.

Before stipulating these characteristics, however, let us restate our definitions of the key concepts of role and role-interface. Role is herein de-
fined as the expectations for normative, appropriate behavior associated with a social status by role audiences. Explicit in this definition, of course, is the possibility of multiple definitional sources and the further possibility of conflicting or non-complimentary expectations. Also explicit in this position is the use of role as a sociological concept descriptive and analytic of the dynamic dimension of the structural referent status.

Role interface is that conjunction of norms, expected social characteristics and attitudes between two or more which constitute the elements within roles of two or more roles in which the role incumbents interact. This definition implies that the interaction among those occupying different roles can be made possible, delimited, predicted and understood by the nature of the interface among the roles. Those role elements in a given role which are germane to interface are not part of the second role with which interface occurs. Operationally, the properties defining type of interface - predicting variable outcomes according to type of interface, consist of the perceived characteristics of both the other role and potential performance of that role as these characteristics interact with and influence a role-audience's expectations for own role and its performance. A complete description of an interface and analysis of its consequences should, of course, recognize that this dynamic process is working reciprocally between all the interacting roles in a given situation or a given structure. The interface concept should be potentially useful in the analysis of the development and functioning of large scale formal organizations as well as dyadic interactions between specific roles. In its initial application we have deemed it best to restrict our
research interest in interface to a dyadic relationship between student and teacher roles. The complexities inherent in a more ambitious goal seem too great at this level of development of the concept. There are still too many potential ambiguities and unforeseeable subtleties in the concept to warrant a more ambitious set of research questions and goals at this time. In deed, for reasons of time and available research resources, we will, in this investigation, investigate only that portion of interface defined by the study of teachers and the teacher role as these effect teacher role performance and expectations.

For the teacher/student role dyad under consideration and the ages of the children involved, we feel that two elements of the role of teachers are relevant. There may, in fact, be others but this is an exploratory investigation with reference to the concept of interface so it will be restricted to characteristics that seem obviously relevant. For the two criteria we will be looking at, it seems reasonable to assume that there will be a fairly wide distribution of types among teachers. It should be specified that, lacking prior data, it would be premature to predict directional relationships between one variable of interface and the dependent variable. This derives from the fact that many more, unspecified dimensions or factors than those being considered may be relevant.

The first criteria we will use to distinguish between these alternative teacher role content types is teacher perspective regarding developmental vs. intervention in early education theory. The issues summarized by these two labels are discussed in detail in Early Education, edited by R. Hess and
In an introductory paper Hess succinctly summarizes the salient features or questions arising from the contrast between the two competing perspectives labeled above. He states:

"Is the experience of the three and four year old child only of minor significance to the development of his adult behavior and capabilities and thus deserving of little attention...are the developmental processes and the genetic component in intelligence so over-riding that we may offer an adequate program (early education) merely by providing competent custodial, group baby sitting care?...Or is an organized and pre-planned program of shaping and conditioning the most effective and shortest rout to providing the sort of mind and personality the society will need..."\(^5^6\)

Disregarding, until a later section, the comment about "genetic component in intelligence", this quote outlines the two different perspectives about young children that teachers are exposed to and, presumably, choose between. The basic logic of the so-called developmental school is fairly direct and, to a certain point, nearly unassailable. Simply put, it holds that a child must walk before he can run or that six month old babies cannot speak, much less read and write. At this age level there is little disagreement, but when this train of logic is extended there is. Unfortunately, as Cronbach states, "Most of the studies on maturation have been done with lower animals where no ethical questions arise..."\(^5^7\) If not done with animals researchers tend to focus on children of 2½ or under and then project findings either from the very young or animals to older children. Since reading is a pre-requisite to almost any


\(^{56}\) Ibid.

other academic skill, attention focuses on it. In a typical text used in teacher education we find the following statements regarding the relationship between maturation or readiness and learning. To read "Reading requires a certain level of sensory and neural maturity and until this stage is reached, training has little effect", or "...it is impossible (underlining ours) to teach anything for which the learner lacks adequate mental maturity. Thus the teaching of reading to most children below the age of six or seven is futile...Too early teaching may actually be harmful..."58 Or, in another text, "Trouble starts when we assume that all children should begin reading during the first year (1st. grade)...it may be argued that progress in reading occupies too large a place in determining whether or not a child is ready to undertake 2nd. grade work."59 Such a position has extreme implications for the early education teacher who accepts them. To use contemporary jargon, it means that a teacher has a built in and ideologically respectable "cop out to explain the child who does not progress. He was not maturationally ready to learn and to have pushed him would have been both "futile" and "harmful". In more formal jargon it means a limited and special type of interface between the teacher and student roles. Since student capabilities and subsequent performance are dependent upon an uncontrollable variable (maturation), teacher role-taking in this regard can be extremely limited. The seating of specific goals for children and the development of a set of teacher behaviors which take into account student role behavior to achieve


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the goals are relatively pointless as part of the teacher role. The general developmental process, which is beyond the teacher's control, sets effective limits on teacher adjustments in own role-behavior. While some variations in teacher role-performance may be effective within the limits imposed by the developmental process, this same process makes superfluous some potential variations in teacher role-performance. Thus, teachers taking a role shaped by this belief would be characterized by: 1) not setting anything other than maturation goals for children, and 2) allowing unstructured play and work situations which would permit eachchild (not his teacher) to meet his own individual needs.

What of the contending position? There is little disagreement with the above position where children through ages two or three are concerned. Beyond that, however, the contending orientation asserts that there is a sort of threshold effect wherein a given level of maturity having been achieved, children can learn anything. An example of this point is the contention by Bruner"...that calculus can be taught in some form and by some suitable chosen method, in any grade..."60 No formal, comprehensive statement of postulates and premises, to our knowledge, exists for this perspective. It is, rather, eclectic, drawing from the work and theory of people like Bruner, Skinner, Brookover, and Bereiter-Englemann. Its distinctness from the former perspective, however, is quite clear and Bruner's emphasis on form of material and method if illustrative of the difference. In as much as it is assumed that

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all children except the organically impaired, having reached a certain maturity threshold, can learn anything, then non-learning must be explainable in terms of deficiencies, not of the child's maturation, but, rather, of manipucable variables such as method, enivironment, material, etc. In other words, the onus of non-performance is transferred from the child to extraneous variables or people. Whereas in the developmental perspective a child's lack of performance can be attributed to something that is non-negative for both the teacher and child, in this perspective some responsibility must be borne by someone. What are the educational and, more specifically, interface implications of this perspective? Educationally, it implies the setting of specific goals for individual children rather than accepting pre-determined goals for developmental levels of classes of children. This, of course, effects the type of resultant interface between the teacher-student roles. Recall that role-taking is an integral dynamic in what we have termed interface. In order for a teacher to engage in role-taking with reference to the student role, the teacher must structure such role-taking with reference to some intended or anticipated behavioral outcome or goal for the student. In other words, role-taking does not occur in a content vacuum. It involves alternative purposive behaviors on the part of the teacher which are selected from on the basis of their probable contribution to eliciting a desired response from the other role - in this instance the student role. Where children are seen as representatives of a developmental category whose characteristics are pre-eminient in determining outcomes, interface occurs between the teacher role and the perceived content of the developmental level. The
Teachers own behavior or role-performance is structured with reference to consideration of the totality of content of the developmental category or level. This means that the range of acceptable alternative modes of teacher role-performances are limited by the content of the developmentalist perspective. Hence, a unique kind of interface between the student-teacher role that is tied to acceptance of the developmentalist perspective as being of primary importance in the definition of possible and appropriate student behavior. Where developmental characteristics are given secondary consideration and the child's characteristics are primary, however, a different type of interface occurs. In this instance the teacher role-taking occurs with reference to characteristics of the individual child and the teacher's subsequent selected role-performance is potentially less restricted. Here interface involves attention to the individual child, as a status encumbent, whose own characteristics must be taken into account and enter, through interface, into the teachers own role by influencing the selection of alternative modes of teacher role-performance.

This can and should lead to the kind of individualism of method and material appropriate to the needs of particular students. In other words, in this perspective there is something more than a nominal or categorical interface - as occurs in the developmentalist perspective - between the student and teacher role. Teacher role performance should be structured on the basis of anticipated, potential student response to that performance, and, thus, the two roles could be said to partially merge or have interface. Specifically, then, what sort of behavior would characterize such a teacher?

Such a teacher would, we feel, be more likely to: 1) approach academic material with young children, 2) set specific, individual goals and 3) be willing
to innovate either curriculum or method without undue allegiance to any instructional dogmas. We recognize that we have painted two extreme or ideal types unlikely to be found in the real world of teachers, but the necessity of this has been discussed. Further, our remaining differentiation characteristic should further enhance our ability to classify teachers. Having traced the logic of this differentiation in some detail to illustrate our approach we will be more parsimonious in the succeeding discussion.

The second criteria used as a basis of differing definitions of teacher role has to do with different perspectives on intelligence. In general these perspectives can be labelled as the open and fixed perspectives on intelligence (elaborations of these perspectives can be made in terms of general and specific intelligence, but in this exploratory research it seems advisable to refrain from going into that detail.). The development of the concepts of open, fixed, general, and specific intelligence along with detailed discussions of their implications are widespread. Several of the teacher education texts already cited (Cronbach, Chapters 7, 8 & 9)(Stroud, Chapter 7)(Bailer & Charles, Chapter 10)(Hess Chapter 1) go into detail and they are particularly appropriate since they help shape teacher attitudes during professional socialization. In summary here we can state that the fixed perspective assumes an absolute maximum level of capability among children, that is fixed by genetic inheritance. It is not necessarily a nature vs nurture dichotomy, however, since it is assumed that variations below that maximum level can occur among persons with the same basic capability as a result of differential experiences. Nonetheless, in the extreme instance of the very low performing child there is a tendency to attribute that low performance to a lack of innate capability.
The open intelligence perspective on the other hand, sees all except impaired children as having a capability to learn anything. While this perspective accepts the fact of genetic differences they count them as relatively unimportant. As was the case earlier, they see intelligence or capability to learn as a threshold which, once passed, can be modified by curriculum, teaching method and experience. In other words, they see a minimum level of intelligence, below which learning is severely impaired. Any child who has at least this minimum level, however, is seen as capable of learning any material is properly prepared and presented.∗

As far as teacher role interface with the student role is concerned, we have much the same situation as existed between the developmentalist type of teacher and interventionist type of teacher. The fixed capability orientation tends to see non-controllable variables associated with the child as the key to performance. So long as a tried and true curriculum and teacher behavior pattern work, for whatever reason, for children defined as capable, there is little incentive or justification for establishing a teacher role with individual rather than categorical interfaces with students. Consequently, goals for students tend to be categorical and there is the assumption that maximum exposure to unstructured experiences will promote, through stimulation, the development of innate capabilities. The interface that occurs, of course, is an interface between the teacher role and the content of the fixed intelligence perspective as this content is relevant to the structuring of the teacher role. The open perspective, on the other hand, tends to look more at individual children in terms

∗The concept of "threshold levels of intelligence" was introduced to the author by Wilbur Brookover in class discussions and unpublished material. We are indebted to him for this concept and can report that a full development of the concept included in a forthcoming publication by Brookover and Erickson.
of their needs and how they can best be met. Goals are child specific since
specific methods may be required for each child. Thus, interface will occur
between the teacher role and the child's characteristics as the child is seen
as a student role representative. This implies, of course, far more structure -
though not habit - in teaching method and curriculum.

Because, again, of the exploratory nature of the research and, in addition,
because of the dummy variable regression analysis technique to be used, teachers
will be characterized as being either of two ideal types. In other words, they
will be placed, for analysis purposes, into one of two ideal type categories
which, for lack of any existing labels, we will term developmentalist and inter­
ventionist respectively.

We have covered a great deal of information. Before going on to an explicit
statement of research objectives it seems desirable to review and summarize key
points with specific reference to the academic achievement of disadvantaged
children in compensatory programs. This investigation was begun based on the
premise that apparent lack of success in compensatory programs could be attri­
buted to many things other than genetic characteristics of student participants.
One particularly crucial variable in any learning situation should be the class­
room teacher; and, of the many variables that could have been studied, the class­
room teacher is the one we have selected to investigate. While a great deal of
prior research has been done that investigated relationships between teacher
characteristics and learning outcomes of students, we have suggested that many of
the results are problematical in interpretation. This is due, in part, to the
lack of an organizing theoretical framework that could both structure the investi­
gations and provide an interpretive framework for the results. We have proposed
the role-perspective as an organizing framework for this investigation. We are concerned with the student status and the adequacy with which the role associated with this status is acquired, particularly as this adequacy is indicated by actual role-performance or behavior, as indicated by performance on I.Q. tests, in the status. The particular role-perspective tradition that has been selected defines role on the basis of the expectations of role-audiences - in this case the teachers - who establish the norms that provide the basis for evaluation of role-performance. In other words, this perspective leads us to expect behavioral outcomes among students to vary in relationship to variations in the structure of expectational priorities of their teachers. In addition, the model stipulated includes, as a new element, the concept of role-interface which suggests that form of communication of expectations is also an important variable. Specifically, we have proposed that teacher expectations for self in status of teacher role should meaningfully influence the way in which they interact with students in teaching the students their role. This interface between student and teacher role should lead to variations in student acquisition of a role which has implications for the student's ability to learn. With these general points in mind we are prepared to state specific research objectives.

Research Objectives

Our research objectives are stated in the form of a series of three null hypothesis. They are:

1) There will be no significant differences in the achievement levels of students whose teachers hold different expectational patterns of priorities for students.

2) There will be no significant differences in the achievement levels of students whose teachers hold difference in expectational priorities for selves as teachers.
3) There will be no significant differences in the achievement levels of students whose teachers have different combinational patterns of expectational priorities for students and self in interaction.
Methods

This study utilizes data and background material from the previously cited study by Erickson, et al.\(^6\) That study investigated the effects of different curriculum structures on the achievement of disadvantaged children in compensatory education programs. Immediately below we will provide information on the basic design and methodology of that study - particularly as it effects the present investigation. Following this we will present the same information relative to this investigation.

Initial Study

Student Population

The student population for the initial study was comprised of all inner-city children in a mid-western city, population approximately 384,000, who were eligible for a compensatory pre-school training program (Head Start) funded by the Office of Economic Opportunity under O. E. O. contract 4150.\(^\text{62}\) Eligible children of the inner-city, a designated O. E. O. target area, were identified by teachers and administrators in the spring of 1967. There were approximately 1,000 children in the initial study.

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\(^6\) Erickson, et al, loc. cit.

\(^\text{62}\) Standards for selection were based on consideration of the criteria of family income and size. A complete exposition of eligibility standards are contained in, Economic Opportunity Act of 1964, as amended; "P. L. 89-794, Title II; 42 USC 2781, et seq., 78 STAT 508 as amended, 79 STAT 973; 80 STAT 1451

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Student sample-year one

O. E. O. contract 4150 involved two different pre-school curriculums during the first pre-school year of the contract and one follow-through curriculum during the kindergarten year. For the pre-school year a table of random numbers was used by the investigators to select two 180 child groups from the 1,000 child population. The two 180 child groups were placed in one or the other of the two experimental pre-school curriculums. The remaining 640 eligible children constituted a control pool. The names of children selected for inclusion in the experimental programs were given to teachers in the schools where the programs were to be conducted. These teachers, under supervision, then contacted the children's parents to offer the opportunity of participation. In these cases where families had moved or the parents declined to allow their children to participate, replacements were randomly drawn from the control pool. The same procedure was followed if children dropped out of the program during the year. Only children with at least 7 months in the program were used in the analysis. Assignment of students to particular classes or teachers within the programs was also done randomly. Teachers were given no opportunity to reject or select particular students. The final form of the student samples for year one are summarized below in Figure 3.1.

Figure 3.1

DESIGN FOR STUDENT ASSIGNMENT YEAR ONE

| Curriculum A (Bereiter-Engleman) | 180 randomly drawn and assigned students |
| Curriculum B (termed Enrichment) | 180 randomly drawn and assigned students |
Control Pool (no pre-school)  640 (approximately)
Total Population           1,000 (approximate)

All 360 children in the two experimental programs were tested at the end of the pre-school year. Thirty randomly selected children from the control pool were also tested. Test results from this testing provided the data for comparative analysis of program effectiveness at the end of year one.

Student samples - year two

At the end of pre-school, the school, on the basis of student achievement in pre-school, as measured by the above mentioned tests, selected one of the experimental curriculums—the Bereiter-Engleman—for an experimental kindergarten follow-through program. To assure adequate representation of all categories of pre-school experience in this second year curriculum it was necessary to sample purposively in the second year of the experiment. One Hundred Twenty students were randomly selected from each of the 180 student pre-school groups and assigned to the experimental kindergarten program. In addition, a random sample of 60 of the control pool children with no pre-school experience were also assigned to this experimental curriculum. All remaining children from the two pre-school programs and the control pool entered regular kindergarten classes. The final distribution of the population among programs during year two is shown in the first three columns of Figure 3.2 below.
At the end of the second year random samples of 30 students from each of the six categories above were selected for testing. Data from these tests constituted the measurement of the dependent variable of the study for year-two. Actual testing N's for each category are shown in column 4 of Figure 3.2. The students comprising the samples listed in column 4 also comprised the sample in the present investigation.

**Teacher Population**

Fourteen teachers comprised the teacher population during year-one of the study. Seven teachers participated in each of the two experimental curriculums. Attitudes of participating teachers toward the respective curriculums were assessed by an attitude survey prior to the beginning of year one and teacher assignments

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**Figure 3.2**

**DESIGN FOR STUDENT ASSIGNMENT YEAR TWO**

<table>
<thead>
<tr>
<th>1st. Year Curriculum type</th>
<th>2nd. Year Curriculum Type</th>
<th>N</th>
<th>Testing N Year Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-E</td>
<td>B-E</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td>B-E</td>
<td>B-E</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td>B-E</td>
<td>Reg</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>En</td>
<td>Reg</td>
<td>60</td>
<td>28</td>
</tr>
<tr>
<td>Control Pool</td>
<td>B-E</td>
<td>60</td>
<td>29</td>
</tr>
<tr>
<td>Control Pool</td>
<td>Reg</td>
<td>580</td>
<td>29</td>
</tr>
<tr>
<td>TOTALS</td>
<td>(Approximately)</td>
<td>1000</td>
<td>176</td>
</tr>
</tbody>
</table>
were based on the results of this survey. The investigators were concerned to insure that teachers with both positive and negative attitudes toward the respective curriculums were included in each curriculum staff. This was to minimize the effects of positive ideological commitment on outcomes potentially attributable to the respective curriculums. Table 3.1 below indicates teacher assignment pattern based on attitudes toward one curriculum (B-E). Attitude toward the other curriculum (Enrichment) can be inferred from this table by identifying teachers negative toward B-E as positive toward Enrichment and vice-versa.

Table 3.1
TEACHER ASSIGNMENT TO PRE-SCHOOL PROGRAMS
BASED ON ATTITUDE TOWARD THE B-E CURRICULUM

<table>
<thead>
<tr>
<th>Attitude Toward B-E</th>
<th>B-E Pre-School (N)</th>
<th>ENRICHMENT Pre-school (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Positive</td>
<td>4</td>
<td>3*</td>
</tr>
</tbody>
</table>

*It should be noted that three teachers, while less negative toward B-E than those categorized as directly negative, were still moderately negative toward B-E & positive toward Enrichment.

The teachers in the Bereiter-Engelman follow-through kindergarten were drawn from the ranks of participating first year teachers; but since they were not, in the initial study, considered as variables, they were not identified as a population.

Variables

The dependent variable in the investigation was student achievement as in-

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63Erickson, et al., op cit., see appendix B10
dicated by scores on Stanford-Binet I.Q. tests. The students indicated above were tested in the end of the first and second years by independent testers. That is, each student was individually tested by naive testers who were not part of the investigating team.*

The independent variable during the first year of the experiment was the type of curriculum experience, i.e., Bereiter-Engelmen\textsuperscript{64}, Enrichment\textsuperscript{65}, or none as indicated in Figure 3.1. Only an interim evaluation was conducted at the end of year one, however, since the program was intended as a two year experiment, first year results were used to select one of the two first year Head Start curriculums for an experimental kindergarten follow-through. The B-E curriculum was selected on the basis of the apparently superior achievement of the students participating in it. The major independent variable was the type of curriculum experience pattern as determined by the combination of pre-school and kindergarten experience. This resulted in to six curriculum experience categories shown in Figure 3.2.

The premises that underlie compensatory programs lead us to believe that there

\*This investigation used these data as our dependent variable. This utilization of initial study data prohibited the gathering of pre and post test data on students. Such comparative data could have added a significant dimension to our investigation, but it was not, in this instance, available.

\textsuperscript{64}For a description of this curriculum, see Bereiter, C., and Engelmen, S., Teaching Disadvantaged Children in the Pre-Schools, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1966

\textsuperscript{65}For a description of this curriculum see Erickson, et al, op cit., Appendix D
should be limited variability among the disadvantaged with reference to traditional control variables. The initial investigation did not, therefore, predict formal relationships between control variables and the dependent variable. By definition of eligibility requirements, program participants were similar in age, family income, etc. Nonetheless, basic demographic data on age, sex, family structure, race, number of siblings, medical and dental histories were gathered. Analysis of these data revealed no relationship between these traditional control variables and the dependent variable.

Analysis

The principle analytical approach in the initial study was the multiple regression approach of Kelley, et al. This technique carries out and provides analysis of varience, partial correlation coefficients, and what the authors call an interactive correlation. The latter provides a correlation coefficient and $R^2$ based on two or more variables considered simultaneously as though they were one variable rather than a series of partials correlations based on discrete, individual variables. It is, therefore, sensitive to the possibility that two or more variables occurring in each others presence may produce effect both qualitatively and quantitatively distinct from their individual effects simply added together. In addition, of course, the initial study included usual descriptive statistics and frequency distributions which were descriptive of populations and samples.

The basic design and results of this study provided a framework for our own investigation in terms of selected variables, populations studied, and analysis.

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modes employed. This will be seen in the following discussion of the current investigation.

Current Study

**Student population and sample**

The student population for this investigation was the same one utilized in the initial study. This population, it will be recalled from the above discussion, was comprised of approximately 1,000 inner-city, disadvantaged children who, in the spring of 1967, were determined eligible to participate in a full year compensatory Head Start Program funded by the United States Office of Economic Opportunity. This investigation, specifically, was concerned with achievement characteristics of a sample of this population at the completion of kindergarten. Some of the children studied had also completed one year of compensatory pre-school.

The children who were studied and who comprised the student sample of this study were the same ones tested and studied in the initial study at the end of year two (see Fig. 3.2, column 4). This sample was comprised of, in our own study, 174 children. These children, who were a sample of convenience for us, had constituted a random, stratified sample in the prior study. They had, as discussed above, been sampled to provide approximately 30 cases in each of six categories of pre-school/

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67 This was two less than the 176 children in the earlier sample. This was because, although data on the children was available, their teachers had left the system and could not be contacted to acquire the necessary data for analysis.
kindergarten experience patterns. In either instance, the studied N was large enough to provide a basis for analysis and generalization back to the 1,000 child population of the studies.\(^{68}\)

**Teacher population and sample**

Strictly speaking, expectational structures rather than teachers are the independent variable to be sampled. However, since such structures are characteristics of teacher roles they are indirectly sampled by sampling teachers.

Since our objectives concerned the expectational structures of early elementary teachers -- particularly kindergarten -- the kindergarten teachers of the school system constituted the population for this study. At the time the studied children were in kindergarten, there were a total of 72 teachers teaching kindergarten - either follow-through or regular. Under a school system cover letter, questionnaires were sent to all of these teachers. Of this number, 57 (79\%) were eventually returned. Of these responses, 26 were from teachers of students in the sample. These teachers taught 174 of the 176 originally studied students. Thus, only two students had to be excluded from our study due to lack of corresponding teacher data. In other words we obtained data on 98\% of the population being studied.

\(^{68}\)While no formal statements can be made generalizing to the total population of disadvantaged children at all times and all places from this 1,000 student population, it will be shown in Chapter 4 that they do not, in any way, appear a typical of disadvantaged children. On an informal basis, then, results of both this and the previous study may be tentatively applied to the general category "disadvantaged children."
As the above indicates we used the entire population rather than a sample of it. It was unnecessary, therefore, to use statistical inferences about the characteristics of the population. At the same time, however, the population is admittedly limited and provides a limited basis for generalization to the larger population of early elementary teachers in general. Limitations of time and resources, however, indicated that this initial effort should be confined to this population, accepting its shortcomings and delaying a more ambitious sampling until findings of this effort have been interpreted.

**Variables and Instrumentation**

As indicated above, the dependent variable in this investigation was the Stanford-Binet I.Q. test, the same one used in the initial study. These scores were obtained from records of the initial study. We will term this variable V1 to simplify future discussion; and we will apply similar notational symbols to succeeding variables.

Findings of the initial study, as stated above, indicated that traditional control variables were not systematically related to the dependent variable. As previously discussed, this was to be expected since the children were all from disadvantaged backgrounds and were, therefore, highly homogeneous with respect to such traditional control variables. Findings of the initial study with reference to variables descriptive of the student population were available in existing records and were obtained for presentation in this study.
The independent variables in this investigation were expectational structures or profiles of priorities of teachers for the role of students and the role of teachers. Measurement of the variables was accomplished by means of the responses to a self-administered questionnaire (see appendix A) completed by the teachers in the spring of 1969. The questionnaire was divided into two sections measuring expectations for the student role (Part I) and expectations for the teacher role (Part II).

Expectations for the student role were, as outlined in Chapter II, divided into four dimensions: 1) physical development, age grade status characteristics (Variable V2), 2) social adjustment (V3), 3) attitudinal development (V4) and 4) skill development (V5)* Physical development, social adjustment, attitude development, and skill development expectations respectively were measured by responses to the following sorts of goal statements: 1) development of appropriate age-grade motor skills, 2) ability to play co-operatively with other children, 3) ability to accept correction and guidance and 4) ability to complete tasks.

All of the items used in the questionnaire were developed through a lengthy process of interviewing employed elementary teachers, reviewing teacher education texts, and pre-testing. Initially, teachers from another school system were informally interviewed to determine the kinds of goals they felt were most relevant for this grade-age of children.

*These, of course, correspond to Nadel's categories of Status Characteristics, Attitudinal Characteristics, and Behavioral Characteristics.
An inventory of their suggested goals was then compared to teacher education text, and recurrent comparable goals were selected as potential items for the questionnaire. Using these items several alternative questionnaire formats were developed and administered to volunteer elementary teachers in a pre-test. Following each test the teachers were interviewed to determine if there were stylistic ambiguities and to determine which items seemed, to them most clearly contrasting of alternative goals. Using those items on which the teachers expressed consensus, a final inventory of potential items was developed for submission to a panel of judges. The panel of three judges was used to select four sets of three items each which were deemed theoretically representative of each of these four dimensions.\(^{69}\)

Items within the questionnaire appear as statements of potentially desirable objectives for students in the appropriate age range (see Appendix A). The items within the questionnaire were arranged in sets of three. These sets consisted of 1 item from each expectational dimension. Respondents were instructed to choose one objective in each set as being most important, in their minds, for students to meet. To compare every dimension to every other dimension required six separate sets of three paired statements or, a total of eighteen separate comparisons. The six

\(^{69}\)The panel was composed of Drs. Stanley Robin, James Bosco, and the Author. The three items selected were those items which all the three judges were able to agree theoretically represented the respective dimensions.
comparisons were:

1) Physical Development compared to skill development  
2) Physical Development compared to social adjustment  
3) Physical Development compared to attitudinal development  
4) Social Adjustment compared to skill development  
5) Social Adjustment compared to attitudinal development  
6) Attitudinal Development compared to skill development

By summing the number of times any dimension was selected it was possible to determine the relative importance that individual teachers attached to particular expectational objectives. Nine was the maximum score possible for any given expectational dimension. Structure of the questionnaire was such that two, but not more than two, dimensions would be relatively important for each respondent. Thus each teacher was determined to hold one of six possible patterns of expectational priorities for the role of student. These patterns were defined by the two high priority expectational dimensions selected by the teachers. They were:

1) Physical development and social adjustment (Variable V6)  
2) Physical development and attitudinal development (V7)  
3) Physical development and skill development (V8)  
4) Social adjustment and attitudinal development (V9)  
5) Social adjustment and skill development (V10)  
6) Attitudinal development and skill development (V11)

These teacher expectations patterns for the role of student, specified as above (V6-V11) constituted one independent variable in the categorization was teacher expectation priorities for the teacher role. The same panel of student role and teacher role expectations or what we have called interface. There are six expectations for student role categories and three expectations for teacher role categories. This makes a total of 18 possible
patterns of role interface. This constituted the final independent variable whose effect on the dependent variable we were interested in determining.

Analysis

For description purposes, traditional frequency distributions expressed in percentages or proportions will be employed. As indicated in the above discussion, data on race, state of health, intactness of family, and language used in the home were gathered. Although these data will not be used in testing hypotheses, they will provide necessary descriptive information about the samples and population. Such background data was not gathered on the teachers studied. Prior research concerning characteristics of teachers in compensatory programs, relative to things such as age, sex, experience, degrees, etc. has indicated no significant relationships between such characteristics and program outcomes. There seemed no point in potentially jeopardizing the reliability or validity of the data we needed just to collect data which was not going to be useful and which might effect promised teacher anonymity.

Sociological theory has long recognized that few, if any, behavioral outcomes result from simple one to one linear relationships between two variables. Increasingly, in recent years, research designs and analysis methods capable

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70 A detailed review of all such research relating to Head Start Programs is contained in Office of Economic Opportunity Pamphlet 6108-13, "Review of Research 1965 to 1969" by Project Head Start in June, 1969.
of dealing with theorized multiple relationships have been developed, to try and deal with theorized multiple and/or non-linear relationships. The introductory problem statement of this paper stated that, with reference to the dependent variable of academic achievement, a great many variables probably interacted in complex ways to produce observable behavioral outcomes. Refer to needs of our hypothesis consistent with this premise, we have selected the previously mentioned multiple regression technique of Kelly, et al., as our mode of analysis.

This technique is best expressed in notational form utilizing symbols we have been associating with each variable. The basic formula suggested by Kelly, et al, as an example, is: $Y_t = (P, S_f, S_c)$

Where $Y_t$ - predicted terminal behavior
$P$ - within person variables
$S_f$ - characteristics of focal stimuli
$S_c$ - characteristics of the context

This basic formula, along with examples of $P$, $S_f$, and $S_c$, provides a form of combined methodological and substantive paradigm that can be elaborated or modified to suit specific research objectives. In our study the variables listed under $P$ or $S_c$ have not been used. They are the variables that, in traditional methodological vernacular, would have been termed control or demographic variables. We have already discussed the reasons for not needing these variables with the samples and population of this study. This can be clarified further, however, by noting that Kelly lists adult expectancies as $S_c$ variables. It may appear inconsistent, therefore, to use teacher expectations of role as $S_f$ variables in this study. The reason lies in the
character of the expectancies. From parents or peers expectations of role could rightly be taken as constituting a context for learning behavior. If our objective were to compare disadvantaged to advantaged children these would be theoretically important variables. In this instance, however, the objective is to assess the potential impact of stimulus variables on changing the state of a category of children rather than the pre-treatment differences between several categories of children. As noted before, labeling children as disadvantaged logically implies the premise that the relevant Sc variables are sufficiently uniform among subjects to produce the state of being disadvantaged. Teachers, however, are not necessarily uniform. In the vernacular of the present they are expected to be part of the solution not part of the problem. For this reason we see both teacher expectations of the roles and type of curriculum (the major independent variable of the initial study) as theoretically relevant for causal stimulus variables.

The regression technique we will be using involves assessing the impact of the presence or absence of a particular variable on the behavioral outcome or dependent variable of concern. Kelly's approach allows us to determine the impact of both adding in variables and considering the interactive effect of two or more variables or patterns of variables.

In its simplest form the regression technique we will utilize involves the alternative computation of analysis of variance. It provides for determining if the means of two different groups, differing on a predictor or independent variable, are different. In addition, it provides for determining if the mean of a sample group (full model in Kelly's terms) differs from that of the total population where no samples are selected out on the basis of a
predictor variable (restricted model in Kelly's terms). In addition, this analysis type will provide an $R^2$, "...which reflects the amount of total variance in the criterion vector (distribution of dependent variable) which is predicted by the predictor variable...". It is also possible to use the $R^2$ value to calculate the $F$ ratio needed for analysis of variance. It too, the $R^2$, can be calculated on the basis of either a full or restricted model.

The $R^2$ value can be calculated taking, as discussed above, into account the impact of a given predictor variable or combinations of patterns of predictor variables. This procedure is illustrated in the initial study of the effects of pre-school programs and kindergarten programs both as separate predictor variables and in interaction. In this instance it was shown that considering these two curriculum experiences in interaction explained more of the variance than either variable considered singly or both variables simply added together.

Our expansion of the initial analysis will involve a study of the amount of additional variance explainable in the criterion vector (dependent variable) by consideration of the effects of the variables of teacher expectations for the student role and teacher role both singly and in interaction. The stipulation of statistical hypothesis of comparison between all possible combinations of the six student role plus three teacher role expectation patterns

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71Kelly, et al, op cit., p 66
72Ibid
would be exceedingly long. Further, we are unable, on the basis of existing theory, to make substantive predictions about the effects of all these profiles on the dependent variable. Kelly's technique which will consider all such possible patterns and calculate the amount of explainable variance associated with them is, therefore, particularly appropriate. It will enable us to thoroughly consider the implications of the data for the theoretically unspecified issues involved.
FINDINGS

Overview

We will begin this chapter with a summary review of significant findings and conclusions of the initial study which, as stated above, provided both a context for this investigation and encouragement to conduct the investigation. Next we will present our own findings.

Findings

Initial study

As indicated in Chapter 3, children in the study were selected on the basis of meeting Office of Economic Opportunity eligibility standards. There was, therefore, every reason to expect that these children would, on variables such as sex, racial identity, intactness of family, etc., be typical of what are termed "disadvantaged". Any informal generalizations to such a population on the basis of findings of either study are meaningful only to the extent that this expectation holds up. Descriptive information about the children on these and other variables are presented in Table 4.1.73

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73 This and other tables in this sub-section are reprinted from Erickson, et al., op. cit., with permission of the authors.
TABLE 4.1

PROPORTION OF INNER-CITY DISADVANTAGED CHILDREN BY SEX, RACIAL IDENTITY, INTACTNESS OF FAMILY, LANGUAGE USED IN HOME, DENTAL STATUS AND MEDICAL STATUS: GROUPED ON THE BASIS OF PRE-SCHOOL AND KINDERGARTEN EXPERIENCES

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total all programs</th>
<th>Bereiter-Engelmann Kindergarten</th>
<th>Regular Kindergarten</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=176</td>
<td>N=30</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>52</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Non-White</td>
<td>59</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Broken Family</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Other than English used in home</td>
<td>03</td>
<td>03</td>
<td></td>
</tr>
<tr>
<td>Dental Problems</td>
<td>14**</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Medical Problems</td>
<td>02**</td>
<td>0*</td>
<td></td>
</tr>
</tbody>
</table>

*Percentage > 0 < .05
**Data obtained during kindergarten year.
+Taken from Erickson, et al p #17

N=176 students.
As Table 4.1 reveals, the distribution of subjects by sex is approximately even. More important, however, are the data on racial identity and frequency of broken homes. A high percentage (40%) of the children were from broken homes. Initial inclusion in the program also insured that only children from low income families would be included in the program. Further, as the table indicates, a majority of these students were non-white. This provides an opportunity to test Jensen's thesis that genetic, racial factors contribute to academic achievement. In summary, then, Table 4.1, plus initial eligibility inclusion standards, indicates that data used in analysis came from children of low income families who are predominately non-white and with a greater than normal frequency of broken homes background — in other words — disadvantaged children. In addition, Table 4.1 indicates no unusual language, medical or dental factors that might have affected the observed outcome of these studies.

The achievement outcomes at the end of pre-school are indicated in Table 4.2 below. It shows level of achievement on the Stanford-Binet according to pre-school experience—or lack of it. Children with Bereiter-Engleman pre-school experience had a \( \bar{X} \) I.Q. of 108.1, highest of any group tested, and significantly above national norms for affluent children. Children with Enrichment pre-school experience, at 105.7, were lower but still significantly higher than typical disadvantaged children. Finally, those children with no pre-school had a \( \bar{X} \) I.Q. of 94.8. This, of course, is below both national norms and the norms of their peers who had been in pre-school. Commission and Jensen, these findings indicate, not only a significant difference between
### TABLE 4.3
DIFFERENCES IN INTELLIGENCE OF STUDENTS IN EACH KINDERGARTEN PROGRAM, GROUPED BY TYPE OF PRE-SCHOOL TREATMENT

<table>
<thead>
<tr>
<th>Type of Pre-school:</th>
<th>Type of Kindergarten</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bereiter-Englemann</td>
<td>108.73</td>
<td>13.58</td>
<td>111.67</td>
<td>14.12</td>
<td>.81</td>
</tr>
<tr>
<td>Enrichment</td>
<td>103.50</td>
<td>13.29</td>
<td>100.64</td>
<td>13.77</td>
<td>.82</td>
</tr>
<tr>
<td>Control</td>
<td>104.86</td>
<td>16.82</td>
<td>91.49</td>
<td>9.49</td>
<td>3.75</td>
</tr>
</tbody>
</table>

+ Taken from Erickson, et al op. cit. p #57.

garten programs. Second, and perhaps more important, is the finding that children from the control pool ($\bar{X}$ I.Q. end of year one = 94.8) who entered the experimental B-E follow-through had a $\bar{X}$ I.Q. of 104.86 which was significantly better than their peers in the regular kindergarten.

Also important were the findings relative to performance according to racial identification. Contrary to Jensen's contention the findings revealed no statistically significant differences between whites and non-whites, on I.Q. at the end of first grade showed that children with B-E pre-school, B-E kindergarten, and an experimental B-E first grade had a Stanford-Binet I.Q. of 107.2 while control pool children had regressed to 89.4. See Callahan, O., Erickson, E., & Bonnell, J., Third-Year Results in Experiments in Early Education, Research Monograph, Grand Rapids Public Schools, Grand Rapids, Michigan, June, 1970.

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74Continuing study of the children at the end of first grade showed that children with B-E pre-school, B-E kindergarten, and an experimental B-E first grade had a Stanford-Binet I.Q. of 107.2 while control pool children had regressed to 89.4. See Callahan, O., Erickson, E., & Bonnell, J., Third-Year Results in Experiments in Early Education, Research Monograph, Grand Rapids Public Schools, Grand Rapids, Michigan, June, 1970.

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participants and non-participants, but for Bereiter-Engleman participants, a level of performance significantly above norms for non-disadvantaged. As impressive as these results are, however, they were taken as tentative since prior apparent gains in pre-school have faded when children continue in regular school programs. The children were, therefore, followed for further analysis at the end of kindergarten.

**TABLE 4.2**

**DIFFERENCES IN I.Q. AMONG EXPERIMENTAL AND CONTROL GROUPS**

<table>
<thead>
<tr>
<th>Type of Pre-school</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>F++</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bereiter-Englemann</td>
<td>136</td>
<td>108.1</td>
<td>19.90*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrichment</td>
<td>138</td>
<td>105.7</td>
<td>16.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>30+</td>
<td>94.8</td>
<td>13.46</td>
<td>7.25</td>
<td>.01</td>
</tr>
</tbody>
</table>

+ Sample N
++One-way analysis of variance
+++Adapted from Erickson, et al op. cit. p #37

Table 4.3 below shows the results of Stanford-Binet testing at the end of kindergarten. Data in this table show results for all six categories of combined pre-school/kindergarten experience. Two important things are revealed by the table. One, performance levels of children with pre-school experience are maintained either in the follow-through or regular kinderg-

*It is instructive to note that, while children with pre-school experience were highest, on average, in their measured I.Q., the S.D.'s indicate a degree of internal category variability that precludes explaining that positive result in terms of curriculum experience alone. Indeed, in view of the relatively greater homogeneity of the control group, it suggests that participation in the compensatory programs may make other correlates of student achievement even more salient.
of kindergarten. Among children participating in the B-E follow-through, non-white \( \bar{X} \) I.Q. was 106.38 and white I.Q. was 104.58. In the regular kindergarten, \( \bar{X} \) I.Q. for non-whites was 101.96, and the \( \bar{X} \) I.Q. for whites was 100.22. While these findings do not show any superiority for non-whites, they definitely support the traditional sociological conclusion that achievement and/or I.Q. are more closely associated with social class, life experiences, and opportunity than race. Indeed, findings of this investigation are contrary to Jensen's conclusions and strongly suggest that compensatory education is a viable approach to over-coming the effects of being disadvantaged. This, as we have indicated, encouraged us to consider the impact of other variables on the success of such programs in an effort to partially account for prior lack of program success. Our findings presented below will indicate degree of success.

Present Investigation

The children in our investigation were, of course, those in the initial study. The descriptive data presented in the preceding pages, therefore, also applies to our investigation. Analysis grouping of students has been done according to pattern of teacher expectations rather than curriculum experience in accordance with our hypothesis. Since teacher expectations are the predictor (independent) variable, then, we will proceed directly to findings relative to them.

Questionnaires were sent to the 72 kindergarten teachers in the school system, accompanied by an explanatory cover letter. Eventually, after a follow-up letter, 57 (79%) usable responses were received. Only two of the non-re-
sponding teachers had actually taught part of our student sample and, in each instance, only one student. Thus we received 98% of the teachers in the experimental group. Of the 57 responses, a total of 26 were actually used in testing hypothesis concerning the relationship between teacher expectations and student achievement. For analysis purposes, therefore, only two out of the original 176 students had to be dropped. Table 4.4 below shows the basic priorities for the student role of the entire teacher population responding.

**TABLE 4.4**

**TEACHER EXPECTATIONAL PRIORITIES FOR THE STUDENT ROLE IN ELEMENTARY CURRICULUMS (N=57)**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Priority Ranks (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowest Priority 4</td>
</tr>
<tr>
<td>Physical Development</td>
<td>56.6</td>
</tr>
<tr>
<td>Social Adjustment</td>
<td>23.3</td>
</tr>
<tr>
<td>Skill Development</td>
<td>13.3</td>
</tr>
<tr>
<td>Attitudinal Development</td>
<td>1.6</td>
</tr>
</tbody>
</table>

These basic percentages indicate that most teachers (57%) rank physical, age-grade status expectations as lowest priority while relatively few give such a low rank to either attitudinal or skill development. At the other end of the spectrum none of the teachers ranked physical development as high priority but 76.6% ranked either attitude or skill development as highest priority. Distribution of teachers with regard to social adjustments rank was, however, relatively uniform across all ranks. Perhaps the most important thing to note from these basic descriptive data, however, is that there are differences among teachers
with respect to their expectational priorities for the role of student. Whether these differences are related to student achievement we will consider shortly. Before going to those findings, however, we must report the basic findings relative to expectations for the role of teacher. Thirty-three percent endorsed interventionist teacher roles, 49% intermediate, and 18% developmentalism. Our hypothesis demand that we consider whether these differences are related to student achievement.

It would be instructive at this point to review briefly the way in which the data will be analyzed and used to test our hypothesis. Since the same procedure will be followed with all three hypothesis we will describe it with reference to only the first one.

The first step was to compute individual correlations between predictor or independent variable - in this case pattern of expectational priorities for the student role - and the criterion variable of measured student I.Q. From these values an \( R^2 \) is computed which is descriptive of the amount of variation in the criterion variable which is associated with, or explained by, knowledge of the predictor variable values. This \( R^2 \) value is the one derived from what Kelly, et.al. called the full model where there is full knowledge of predictor variable values.\(^{75}\)

To determine whether this full model \( R^2 \) value is statistically significant, a second \( R^2 \) value for the restricted model is computed, in which predictor variable values are not considered. This provides an \( R^2 \) value descriptive of how much variance could be accounted for in the population or

\(^{75}\)Kelly, et. al., op. cit.
sample without knowledge of the predictor variable. An analysis of variance F ratio is computed from the findings so organized and used to test the significance of the difference between the two \( R^2 \) values. If the differences are significant, we reject the null hypothesis of no significant differences. We may now proceed to testing our first hypothesis of no significant difference. This would be in student I.Q.'s according to their teacher's type of expectations for student priorities.

As the correlations indicate there is a negative correlation between I.Q. and the interventionist priority for the teacher role, while there is a positive correlation between I.Q. and the developmentalist priority. This finding is somewhat surprising. We had expected the interventionist pattern of expectations for the teacher role to be associated with higher levels of student achievement. This outcome will not effect the testing of the hypothesis of no association between the dependent variable and independent variable of interface since there was no direction posited in the hypothesis. A substantive issue does remain, however. We will return to this issue in the conclusions.

The correlations also indicate that the interventionist priority for the teacher role seems to be most strongly associated with physical development and social adjustment priorities for the student role. As the table indicates, these student role priorities are also negatively correlated with achievement. Conversely, the developmentalist priority negatively correlated with these student role priorities and positively associated with those student role expectational priorities of attitude and skill development which are, themselves, positively correlated with student achievement.
TABLE 4.5
CORRELATION MATRIX OF EXPECTATIONAL PRIORITIES WITH STUDENT I. Q.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V12</th>
<th>V13</th>
<th>V14</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Q. (V1)</td>
<td>1.00</td>
<td>-.19</td>
<td>-.27</td>
<td>.16</td>
<td>.29</td>
<td>-.32</td>
<td>.30</td>
<td>.02</td>
</tr>
<tr>
<td>Physical Development (V2)</td>
<td>.42</td>
<td>-.40</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Adjustment (V3)</td>
<td>.73</td>
<td>-.78</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Development (V4)</td>
<td>-.60</td>
<td>.62</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill Development (V5)</td>
<td>-.52</td>
<td>.53</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interventionist (V12)</td>
<td>1.00</td>
<td>-.88</td>
<td>-.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developmentalist (V13)</td>
<td>1.00</td>
<td>.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate (V14)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Even in this instance, however, the above data give no indication of significance. To begin determining if expectations for students are correlated with student achievement we must consider the total expectations for the student role patterns that characterized the teachers.

Table 4.6 shows the basic correlations between the six possible patterns of combined expectational priority patterns plus the actual Mean I.Q.'s and N's of the students in the categories. As shown there was no teacher/student match in the VII category and, in fact, this combination did not occur at all. Within the V8 category there was only one student and this one with an atypically high I.Q. for this or any other population.
TABLE 4.6
CORRELATIONS BETWEEN TEACHER EXPECTATIONAL PATTERNS FOR THE STUDENT ROLE AND MEASURED STUDENT I.Q.

<table>
<thead>
<tr>
<th>Correlation with I.Q.</th>
<th>X I.Q.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Development &amp; Social Adjustment (V6)</td>
<td>-.23</td>
<td>95.20</td>
</tr>
<tr>
<td>Physical Development &amp; Attitude Development (V7)</td>
<td>.00</td>
<td>----</td>
</tr>
<tr>
<td>Physical Development &amp; Skill Development (V8)</td>
<td>.14</td>
<td>131.98</td>
</tr>
<tr>
<td>Social Adjustment &amp; Attitude Development (V9)</td>
<td>-.14</td>
<td>98.38</td>
</tr>
<tr>
<td>Social Adjustment &amp; Skill Development (V10)</td>
<td>-.01</td>
<td>103.31</td>
</tr>
<tr>
<td>Attitude Development &amp; Skill Development (V11)</td>
<td>.25</td>
<td>107.12</td>
</tr>
<tr>
<td>Total N</td>
<td></td>
<td>174</td>
</tr>
</tbody>
</table>

Of the remaining categories the highest individual correlation and the highest student X I.Q. was associated with teachers who emphasized attitudinal and behavioral skill development in combination. Only slightly behind in X group I.Q. was the V10 group.

The computed $R^2$ value for this date (amount of variance in the criterion variable of I.Q. explainable by knowledge of values of the predictor variable of expectational priorities) was .12. Again, this indicates that 12% of the
variance in I.Q. was associated with type of expectational patterns. This $R^2$ is derived from what we identified as the full model where knowledge of the values of all predictor variables is available. To test whether this $R^2$ value is significant another, restricted model, $R^2$ value was computed. This procedure contrasts a dummy population or sample with no variability to the already studied group, computes $F$ values and tests for significance by analysis of variance. Table 4.7 shows the results of that analysis.

**Table 4.7**

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>df</th>
<th>$F$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULL</td>
<td>.339</td>
<td>.115</td>
<td>5/168</td>
<td>4.3867</td>
<td>0.0009</td>
</tr>
<tr>
<td>RESTRICTED</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As Table 4.7 indicates there is a significant difference between this population and a hypothetical population where no difference exists between students and their I.Q. on the basis of teacher expectations. On the basis of this, therefore, we reject the 1st. null hypothesis of this study that there would be no difference between children's achievement that was associated with teacher patterns of expectational emphasis.

Turning our attention to hypothesis 2 Table 4.8 shows the correlation between types of teacher expectations for the teacher role and student achievement, plus
the actual X's and N's of children in the different groups or categories. The unexpected aspect of these findings, however, will not be ignored without an effort at conceptually understanding why a preliminary rationale which suggested directionality failed to be reflected in the analysis.

Again, we take note of the fact that, while the correlation between expectations for the teacher role and student achievement is significant, we are surprised by the direction of the correlation. We suggested in Chapter 2 that, while we thought the conceptual model indicated that the interventionist priority should be associated with higher levels of student achievement, it would be best in this initial effort to test simply for correlation. We do, in fact, feel that there is a theoretical explanation but we will reserve it for our discussion of theoretical implications in the final chapter.

### TABLE 4.8

<table>
<thead>
<tr>
<th></th>
<th>Correlation</th>
<th>( \bar{X} ) I.Q.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventionist (V12)</td>
<td>-.32</td>
<td>98.48</td>
<td>80</td>
</tr>
<tr>
<td>Developmentalist (V13)</td>
<td>.30</td>
<td>108.51</td>
<td>83</td>
</tr>
<tr>
<td>Intermediate (V14)</td>
<td>.02</td>
<td>105.09</td>
<td>11</td>
</tr>
<tr>
<td>Total N</td>
<td></td>
<td></td>
<td>174</td>
</tr>
</tbody>
</table>

These data was used to test our second null hypothesis of no difference in student I.Q. that was associated with types of teacher expectations for the...
teacher role. The computed full model $R^2$ for this data was .106. Computed restricted model $R^2$ value was 0.000. Table 4.9 shows these values contrasted to determine if the differences are significant.

**TABLE 4.9**

**MODELS, F-TESTS, R & $R^2$ FOR PREDICTION OF STANFORD-BINET I.Q. ON THE BASIS OF TEACHER EXPECTATIONS FOR THE TEACHER ROLE.**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>R</th>
<th>$R^2$</th>
<th>df</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>.326</td>
<td>.106</td>
<td>2/171</td>
<td>10.1864</td>
<td>.0001</td>
</tr>
<tr>
<td>Restricted</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the basis of these results we reject the second null hypothesis that there would be no significant differences between the achievement of students whose teachers held different expectations for the teacher role.

The over-all pattern of the findings with respect to both expectations for the student and teacher roles are visually summarized in Figure 4.1. Figure 4.1 illustrates very graphically that type of teacher expectations, either for student or teacher role, are associated with behavioral achievement outcomes in their students and, as the preceding findings have shown, this association is a statistically, and we feel, substantively significant one. Our final hypothesis concerned these two predictor variables in interaction with this interaction being, on an operational level, representative of a dimension of what we have conceptually termed role - interface.
FIGURE 4.1
RELATIONSHIP BETWEEN STUDENT STANFORD-BINET I.Q. AND TEACHER EXPECTATIONS FOR STUDENT AND TEACHER ROLES

Measured
I.Q.
110-
110-
105-
105-
100-
100-
95-
95-
93-

Variables--V6 V9 V10 V11 V12 V13 V14
Student Role Expectations
Teacher Role Expectations

Physical Development and Social Adjustment
Social Adjustment and Social Development Attitude
Social Adjustment and Skill Development
Attitude and Skill Development
Interventionists
Developmentalist
Intermediate

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Testing the null hypothesis of no significant differences in student I.Q. associated with this interactive variable was done using the same procedure used in testing hypotheses 1 and 2. There were 18 possible interactive patterns. Of these 18 only 9 actually occurred in the group studied. Table 4.10 shows the basic correlations between these 9 interaction variables and I.Q., X I.Q., and N's.

**TABLE 4.10**

<table>
<thead>
<tr>
<th>Interaction Variable</th>
<th>Correlation with I.Q.</th>
<th>X I.Q.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Adjustment and Interventionist (V15)</td>
<td>-.23</td>
<td>95.2</td>
<td>25</td>
</tr>
<tr>
<td>Interventionist (V17)</td>
<td>-.149</td>
<td>97.3</td>
<td>19</td>
</tr>
<tr>
<td>Social Adjustment, Skill (V19) Development &amp; Interventionist</td>
<td>-.044</td>
<td>102.0</td>
<td>23</td>
</tr>
<tr>
<td>Skill &amp; Attitude Development and Developmentalist (V21)</td>
<td>.309</td>
<td>108.7</td>
<td>80</td>
</tr>
<tr>
<td>Skill &amp; Attitude Development and Interventionist (V22)</td>
<td>-.066</td>
<td>100.2</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>N = 160</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the data reported in Table 4.9 a full model $R^2$ was computed. Thirteen categories with 4 or less subjects were excluded from the analysis. Following this a restricted model $R^2$ was computed. Table 4.11 shows the results of the comparison of the two.

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>df</th>
<th>$F$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>.398</td>
<td>.158</td>
<td>4/157</td>
<td>7.34</td>
<td>.001</td>
</tr>
<tr>
<td>Restricted</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the basis of the results shown in Table 4.11 we reject the null hypothesis of no significant difference in student achievement associated with different types of teacher-student role interface.

Both the statistical analysis reported in Table 4.11 and the data summarized in Table 4.10 provide substantive support for the validity of the concept of interface. Of the 18 potential patterns of interface possible, only five occurred with any statistical frequency. The 13 discarded combinations showed nine had zero frequencies and four had frequencies of four or less. This indicates the existence of a restricted, systematic, rather than an inclusive random, relationship among expectations for the student and teacher roles, which is necessary if the concept of interface has utility. Again, despite the failure of the data to reflect the directionality initially posited in our theoretical model, a significant correlation has been shown to exist between student
achievement and interface patterns. Figure 4.2 graphically summarizes the patterns of the relationships.

FIGURE 4.2
RELATIONSHIP BETWEEN STUDENT STANFORD-BINET I.Q. AND TEACHER EXPECTATIONS FOR STUDENT AND TEACHER ROLES IN INTERACTION

Measured I.Q.  
110- 
105- 
100- 
95- 
90-  

Variables-
Student Role Expectations
V6  V9  V10  V11
Physical Development and Social Adjustment
Social Adjustment and Attitude Development
Social Adjustment & Skill Development
Attitude and skill development

(Developmentalist)
(Interventionist)
(Intermediate)
CONCLUSIONS

Overview

In the following pages we will discuss conclusions relative to: 1) the viability of compensatory education programs relative to improving academic performance among disadvantaged children, 2) the impact, on such academic performance, of variable patterns of teacher expectational priorities for both the student and teacher role, 3) the theoretical implications of our findings, and 4) a discussion of limitations of our findings and recommendations for future research.

Academic achievement and disadvantaged children

The original contention, by Jensen, that compensatory programs had not and would not produce desired results was based on several related facts and premises. On the other hand, findings available to Jensen indicated that compensatory education programs, until that time, had not successfully altered the academic performance of disadvantaged children. In explanation of this condition Jensen proposed two related premises. One was that there is a genetic factor in intellectual potential. Few, if any, people would dispute this contention. The further contention that this factor is systematically and differentially associated with specific racial or economic classes, however, is far more open to question. Our own investigation, of course, has no direct basis for either confirming or disaffirming premises about genetics since no genetic variables were measured or analyzed. Indirectly, however, successful compensatory programs would do much to dispute Jensen's second premises.
Before continuing to a more detailed consideration of our findings and resultant conclusions a few points concerning the issue of the genetic factor in intelligence need comment. Jensen's article, of course, provided the occasion for a contemporary re-opening of this issue. It bears pointing out, however, that Jensen himself, is not a geneticist. His background and training are in psychology. It should be noted that in that controversial article, Jensen did not endorse the genetic determination position, without qualification, as the final, unchallengable explanation. This has not, however, prevented superficial interpretations that have led to conclusions of variable intellectual potential according to racial origins. Although our own investigation does not include specific genetic variables, it does seem that our data are as applicable to the questions involved as the data utilized by Jansen.

Indeed, our data seem very applicable to issues raised in a more recent article by Hernstein that dealt, again, with the relative contributions of genetics and environment to intelligence. Hernstein did not specifically state that variations in intellectual potential attributable to genetic factors are differentially and systematically distributed according to race. He did, however, state that most learned geneticists were agreed that 80% of I.Q. was dependent upon genetic factors while only 20% of I.Q. was dependent upon environment. Further, he agreed with this position. If, and we emphasize the "if", this is true, the genetic issues in education in general and compensatory education in particular are still not resolved.

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From our own findings we noted that measurement of patterns of role-interface can account for 16% of the variance observed in measurement of I.Q. (See Table 4.10). Role-interface is not a genetic variable. This might suggest, according to the 20% environmental input estimate, that all other environmental factors such as mental, emotional, and physical health, nutrition, family background, aspirations, value systems, religion, etc., account for no more than 4% of observed variation in I.Q. As pleased as we were with our findings relative to interface, even we would not accept such an ambitious claim for it relative to other sociological, environmental variables.

Even if interface accounted for all but 4% of the non-genetic variance the issues are still cloudy. The I.Q. scores that separate the dull from the normal represents less than 20% of the range (unless of course it is posited that the increments on the I.Q. scale are non-interval level measurement). If it is granted that 80% of intellectual potential is dependent upon a genetic contribution rather than environmental variables, we will still have to contend with the question of how environment affects development of genetic contributions themselves.* In other words, how do nutrition, use of drugs, privation, etc., effect the physical development of the organism and the unfolding of whatever inherent genetic potential is there. We are suggesting that the question of the variable contributions of genetic inheritance and environment to intellectual development has

*An individual's maximum potential height, for instance, is genetically determined; but environmental variables such as nutrition and quality of medical attention significantly effect the degree to which maximum genetic potential for height is approached. Increases in the average height of American and Japanese citizens during recent history illustrate this.
been improperly asked. It seems to us that observed intellectual performance is not a question of a simple additive function of two independent contributory variables such as genetics and environment but, rather, a produce of the interaction of inter-dependent variables, both genetic and environmental. We are then, more interested in the general question of whether student achievement, as indicated by measured I.Q., can be improved. Consideration of the findings of both the initial study and this one will provide a basis for trying to answer that question, particularly as it related to disadvantaged children, the efficacy of compensatory education, and variable patterns of teacher role expectations for self and student.

The findings of the initial study and of this study allow us to conclude that it is possible to improve the academic performance of disadvantaged children. The levels of performance achieved and SUSTAINED by children participating in the compensatory programs studied in this investigation are either equal or superior to the norms of performance for affluent children (see Tables 4.2 and 4.6). Although not formally a part of this investigation, we may also report that these results were sustained through a third year of school when many of the students were in regular first grade programs.77 At the same time the academic performance of those disadvantaged students with no compensatory experience continued at a dull normal level. Since it is logically contradictory to achieve improvement in non-improvable subjects we conclude that the contention of irreversible genetic deficiencies in disadvantaged children cannot be held. This conclusion, of course re-opens all the questions concerning why

77 Callahan, O., Erickson, E., & Bonnell, J. op. cit.
previous compensatory programs have been unsuccessful and which variables contribute, in what ways to success or lack of success. Our own investigation cannot answer all such questions. Indeed, in our opening remarks we suggested that the multiplicity of potentially relevant variables revolving around program structure and implementation made any single explanation such as Jensen's seem premature. It is clear, however, that compensatory programs can be effective. This suggests that we need to shift the emphasis of our theoretical and research interest to attempts to determine which variables or classes of variables contribute to learning success. Our own conclusions are intended to shed light on the contribution - or lack thereof - of one such class of potentially relevant variables.

Expectations for the student role and student achievement

It is to be expected, as we have repeatedly stated, that student achievement levels result from the complex interaction of many variables whose saliency may vary over time and place. In this investigation we were interested in determining if varying patterns of teacher expectational emphasis for the student and teacher roles, both individually and in interaction, were associated with different levels of student achievement.

With reference to expectations confined to the student role, the findings indicate a statistically significant relationship between patterns of teacher expectational priorities and student achievement. Substantively, the findings call into question some traditional educational premises and goals for early elementary age children. Traditionally, goals concerned with physical development and social adjustment have been emphasized for this age-grade. Our
findings show, however, that such goals are negatively correlated with student achievement. By contrast, skill and attitude development, frequently considered inappropriate and potentially dangerous goals for this age-grade, have the highest positive correlation with achievement. Further indication of the contribution of either attitudinal or skill expectations to higher levels of student achievement can be seen by outcomes when either one occurs in conjunction with social adjustment expectations. Social adjustment, alone, is negatively correlated with I.Q. (-.27 - see Table 4.5), but when it is paired with attitude development or skill development expectations, the negative correlations fall to -.14 and -.01 respectively. (See Table 4.6) Physical development expectations, negatively correlated with individual I.Q. levels (-.19. See Table 4.5.), did not occur in combination with attitude development expectations and it was combined with skill development expectations only once. (See Table 4.6.) This prevents our drawing any conclusions about such potential combinations. The non-occurrence of such combinations, however, is significant since it suggests that they are, indeed, both substantively different and systematically different in their effects on achievement. It seems clear that an emphasis on both attitudinal expectations (.16) and skill development expectations (.29) are positively correlated with higher levels of student achievement. When they occur in conjunction they continue to be positively correlated (.25) with student achievement. This pattern of combined expectations for student role has, in fact, the highest positive correlation with achievement while, as noted above, the physical development/social adjustment pattern has the lower negative correlation (-.23). Analysis of these findings indicates that they permit us to account for approximately 12% of the variance in student achievement.
on the basis of knowledge of the pattern of teacher expectational priorities for the student role.

**Expectations for the teacher-role and student achievement**

With reference to the impact of teacher expectations for the teacher role on student achievement we again find that there is a statistically significant correlation. Of the three conceptually defined categories of expectational emphasis of interventionist, developmentalist, and intermediate, developmentalist has the highest individual correlation (0.30) with student achievement. The interventionist priority on the other hand is negatively correlated (-0.32) with student achievement. The intermediate priority was represented by only 11 teachers and was not highly correlated (0.02) with achievement. It will be recalled that we had not originally anticipated the analytic use of an intermediate category. Our findings indicate that relatively few teachers do, in fact, fall into this category and, further, the correlation suggests that the lack of a systematic, homogeneous set of expectations results in an unsystematic effect on student achievement. The test for significance clearly indicates, however, that differing expectational priorities for the teacher role are associated with variations in student achievement. Knowledge of such expectational priorities for the teacher role can, in fact, account for approximately 11% of the observed variance in student achievement.

While our findings permit us to reject the null hypothesis for the teacher role, they do so in spite of a substantiate anomaly. Our theoretical framework led us to expect a directionality in the findings which did not emerge.
In fact, the observed direction of the association was diametrically opposite of the expected one. Specifically, we had developed a theoretical framework which led us to expect that interventionist expectations should be associated with higher levels of student achievement while developmentalist expectations should be associated with the lower levels of student achievement. The findings were just the opposite. While, as noted above, this did not necessitate the acceptance of the null hypothesis, it is disquieting to have findings that permit us to reject in spite of, rather than because of, the substantive content of the developed theory. An attempt to account for this anomaly led us to reconsider the content of that theory with interesting results.

In stating our hypothesis we indicated that the lack of directionality, despite its strong indication, resulted from our feeling that we were dealing with a relatively new set of variables. It seemed quite possible that, owing to the complexity of the postulated relationships, there might be additional, unspecified variables involved. In reviewing the theory this seems to be the case. Though unrecognized at the time, a portion of the substantive theory would have, now reviewed through these findings, enabled us to predict the actual directions of association that emerged. Specifically, we refer to prior findings concerning differential patterns of expectations for education associated with different socio-economic strata. Recall that lower socio-economic groups tend to have lower aspirations relative to educational attainment, to regard formal education as less necessary to success, and to regard the educational system and its members as less relevant to them and the needs of their children. The expectation that the interventionist teachers would be associated
with higher levels of student achievement was based on the assumption that students would respond positively to this kind of teacher role performance and recognize the teacher as a credible source of goals and values. Instead, of course, many disadvantaged children do not recognize their teacher as credible sources of goals and values. Thus, the interventionist teacher, actively attempting to modify and structure student behavior, may in the popular vernacular, 'turn the students off'. Their teachers, in short, are not significant, credible others in the mode perceived by their teachers as appropriate and desirable. In a more formal vernacular we can observe that the incongruency between student and teacher expectations for the teacher role results in an inadequate role-interface. This can, we believe, be clarified by integrating this discussion into a consideration of conclusions regarding our findings relative to interface.

Expectations for the teacher role interacting with expectations for the student role operationally corresponded to what we had conceptually defined as role-interface. Briefly, by way of review, interface refers to an interactional dynamic wherein the structure and content of one role or its expectations has impact on the structure, dimensions, and content of another role without actually being formally included in that other role. In our earlier discussion of the nature of this concept we indicated that a complete exposition of the dimensions and content of any specific role - interface would have to include all the interacting statuses and their encumbent role-performances. In this case, for instance, it could include such non-teacher statuses as students, parents, and administrators. At this juncture we are specifically interested in students and how their expectations for the
teacher role effect both the student-teacher role-interface and resultant student achievement.

Interface and student achievement

Our findings, of course, enable us to conclude that the type of role-interface established is associated with level of student achievement. Approximately 16% of the variation in student achievement can be accounted for on the basis of measurement of type of role-interface, while measurement of teacher expectations for the student and teacher roles individually accounts for only 12% and 11%. Of interest, however, is the same directional anomaly. Lowest levels of student achievement continue to be associated with physical development/social adjustment expectational priorities for students. The lowest observed negative correlation (-.23), however, occurs when this student role expectation pattern occurs in interface with the interventionist pattern of expectations for the teacher role. When this student role expectation pattern occurs in interface with the teacher-role developmentalist pattern the negative correlation is reduced to -.15. At the other end of the continuum, the pattern of student-role expectations combining skill and attitude development continues to be associated with high student achievement if it occurs in interface with the developmentalist pattern for the teacher role (.31). However, if it occurs in interface with the interventionist pattern for the teacher role the correlation (-.07) is reduced to essentially zero. Once again it is quite probable that the directional anomaly in the findings stems from the unexpected dynamics of expectations of lower class
students for the teacher role. Considering these expectations as a mere unmeasured component of role-interface highlights, the fact that some incongruency exists between what the teachers consider effective and desirable role-behavior, for the teacher role, and what elicits achievement in students. This interpretation of the findings retains the salience of interface in predicting student achievement, but it also suggests the addition of other variables in developing more specific directional predictions.

In this investigation we propose, as a tentative conclusion, subject to future research, that student expectations for the teacher role were more congruent with those of teachers characterized as developmentalist. Since developmentalist teachers were congruent with student expectations for the teachers, a successful role-interface was established which was associated with higher levels of achievement. The interventionist, by the same logic, was unable to develop interface and the expected relationship to student achievement. In fact, if we look at the level of the correlations involving interventionist and intermediate teachers (-.05, .09, -.07 and -.07), this is the case. We propose that the interface established in these instances was so slight that it wasn't even significantly negative. A truly negative interface should be expected to produce overtly negative, rather than neutral, results.

Indeed, the total absence of 9 potential interface patterns and essential absence of 4 others is significant in this respect. It indicates, on the one hand, that, even when only the teacher is considered as a data
source of expectations, some potential interfaces of elements of the respective roles are so incompatible that they cannot be realistically expected to occur if, in fact, interface describes a systematic dimension of student-teacher role interaction. On the other hand it may also indicate that people who might hold such patterns of interface potential are inappropriate to the teacher role and, if they ever are in the role at all, leave it for another role. Possibly because they find themselves in a form of role conflict. We emphasize the "may" above because this is obviously a question or hypothesis for future research.

We feel justified, then, in concluding that student achievement, considered as a reflection of acquisition of the student role, is effected by patterns of expectational priorities held by teachers for the student and teacher roles respectively. We also feel that the unexpected directionality of our findings is potentially explainable by an alteration or elaboration of the theory already presented. Indeed, we suggest that the anomalies of our findings result from a premature ending of the deductive development of the implications of that theory.

Despite these deficiencies, however, use of the role-perspective enabled us to account empirically for part of the variability in student achievement. Large portions of variability remain unexplained at the completion of this investigation, but we maintained that no single, theoretically stipulated variable was responsible for or could explain all the variability in a given type of behavior. We have repeatedly criticized the single, linear causation model as inadequate. With reference to student achievement or student role performance in which we were interested, there are many additional variables, some probably theoretically unanticipated as relevant as yet, which contribute to observed
variability. For example, we did not attempt, in this investigation, to consider the impact of other, conflicting roles held by either the student or teacher. Nor was any consideration given to variables of the teacher such as experience, training, racial prejudices, etc. Further, although the students were characterized as disadvantaged with all its inherent implications, it would be fallacious to state that they were completely homogeneous with respect to family background variables such as aspirations, positive attitudes toward education, attitudes, values, etc. There could, in addition, be significant variation with respect to nutrition, general health, etc. Further, while we cannot accept the genetic explanation when applied to groups of individuals, the possibility of genetically based individual variations in academic potential is still an open question requiring additional research. Some light could be shed on this question if further research into the impact of variable expectations first measured I.Q. before treatment or exposure to types of expectational patterns. We might determine, by this means, if a particular expectational pattern was uniformly effective for all levels of the I.Q. continuum. It is significant, however, that in spite of the many potential sources of variability not included in this study, a significant percentage of the observed variability in student achievement was accounted for by using the role-perspective. This is particularly significant since it directed our attention to variables that are manipulated by school systems. Many of the potentially contributing variables just discussed are either highly individual (genetic) or difficult to assess and alter (for example, home conditions, nutrition, etc.). The variable of
expectations, however, is something that potentially falls within the sphere of influence of professional socialization of teachers and their professional supervision on the job. Thus, teacher role - student role and their interface are both a significant predictor of variations in student achievement and manipulable if we can map their content and structure in sufficient detail.

Within our definition of role content and structure of expectations is obviously important. To organize our investigation we used Nadel’s conceptualization of important dimensions of expectational structure as a beginning point. His categories, however, are general enough to relate to almost any role. Our knowledge of the student role and its audiences led us to modify the categories. Such a departure from these basic categories is not only justified, but necessary, to increase the efficiency of the model. We were not disappointed because all variability in student achievement could not be associated with this independent variable (expectations for the student role). This definitely does not suggest, however, that the existing levels of explained variance are, or should be considered as, the limits of association and possible explanation of variance inherent in this approach. Our findings do enable us to conclude that different patterns of expectational content emphasis are associated with differential patterns of achievement. Further, it enables us to conclude that emphasis on attitudinal and skill development lead to higher levels of achievement.

Such findings and conclusions suggest that the categories of expectational content and emphasis used to organize this research are at least minimally appropriate. This should not be taken as a basis for suspending further develop-
ment, elaboration, or modification of the categories. The relatively limited number of operational indicants we used (3 per category of expectations for the student role) could not realistically be assumed to exhaust the inventory of potentially relevant items. Of equal importance is the necessity of refining the measurement technique. Our own procedure in this instance involved a forced choice format which seemed appropriate to our intention of trying to determine if minimal levels of substantively significant variation in dimensions of the expectational categories occurred as postulated. Having concluded that such variation does occur and is associated with variations in the dependent variable, it seems reasonable to proceed to develop procedures that will lead to the ability to make finer differentiations.

Even without additional research, however, we feel there are important implications in the findings for compensatory education programs, especially Head Start. The standard deviations reported in Table 4.2 revealed that there was more variability within the experimental curriculum categories than there was in the group of children who did not participate in a compensatory program. This indicates, as suggested earlier, that something other than the type of curriculum was producing systematic variations within, rather than between, the categories of curriculum experience.

Teacher expectations, our findings indicate, are correlated with systematic variations in student achievement. This suggests that selection of

teachers to participate in compensatory programs should be carefully done. To maximize the beneficial impact of successful curriculums teachers selected for participation in Head Start Programs should be individuals who are, or are willing to become, committed to placing priority emphasis on skill and attitude development for children in the student role and, further, who combine these expectational priorities for the student role with what we have termed the developmentalist perspective for their own role as teacher. We should emphasize, however, that this type of expectational configuration can, on the basis of research findings, be shown to be appropriate only for lower-class, disadvantaged children. We strongly suspect that the interventionist pattern of expectations for the teacher role would be more successful with middle-class children. Further changes in class related aspirations and attitudes toward education could even alter the type of teacher role that is most effective for lower class children.

Let us, then briefly summarize our conclusions concerning the impact of variable expectations on student achievement. The content and priorities of expectations for the student role and teacher role, both individually and in the interaction mode we have defined as role-interfact, are significantly correlated with variations in student achievement. This conclusion does not justify any lessening of efforts to determine what other variables contribute, and how, to variations in student achievement. Further, our own findings, rather than allowing us to conclude that we have adequately stipulated the dimensions of expectations and how they effect role-performance, lead us to conclude that additional research is needed to further refine our theoretical understanding and knowledge of the content, structure, and dynamics of expecta-
To suggest directions for such future efforts we will turn to the theoretical implications of the findings of this investigation.

**Theoretical implications**

The first consideration is about the efficacy of the role-perspective for the task of organizing this investigation and, further, for producing useful findings. In approaching this issue it is appropriate to reiterate the rationale for selection of the role-perspective in this research.

It will be recalled that we were interested in a particular facet of the behavior of children. Specifically, we were interested in achievement behavior and its correlates within the context of an educational system. We took, as a basic assumption, the position that there is a basic similarity between all children and their relationship to the educational system. It was assumed that the relationships could be located in a systematic organization of relationships structured around the goals of education. In locating the relationship of the children to the rest of the system we structurally specified the children as being in the status of student. This identification and location provided a basis for delimiting the relevant behaviors and variables to be studied. It directs our attention to the dynamic, behavioral aspect of the status of student or, in other words, the student role. The role-perspective focuses our attention on particular facets of child behavior and, further, imposes a minimal level of order on the behavior observed. At the same time it suggests the degree of importance or, perhaps more significantly, non-importance of other child characteristics and behaviors such as, for in-
stance, eye color, shoe size, speed as a runner, talent as a singer, etc.

Such was the original rationale for selecting the role-perspective as our organizing theoretical framework. Using this perspective, we were able to identify both substantively and statistically significant correlates of student achievement behavior. This justifies, in our opinion, the conclusion that the role-perspective is useful in investigating the behavior and its concomitants that were the units of analysis of the investigation. It also is one more finding in the long series of research that lends support to the conclusion that the role-perspective will be useful in studying a variety of dimensions of behavior of individuals involved in social systems.

These conclusions were, of course, almost a routine matter. The prior use of the perspective has more or less established its usefulness in such investigations. Of more interest are the conclusions relative to the differential utility of using alternative conceptualizations of role within the general role-perspective. We refer to the alternative conceptual definitions of role as, respectively, behavior performed in a status and expectations for behavior associated with a status.

This investigation and its findings provide a basis for contrasting the utility and possible modes of application of these two traditions of role-definition. The basic unit of analysis in this investigation was student achievement behavior. Either framework could have provided a systematic basis for investigating this unit of analysis. Investigations, however, inevitably lead to new questions and, hopefully, new insights into the complexity of the unit of analysis. The potential utility of any organizing framework for an investigation
must, we feel, be measured in terms of something more than its ability to
deal with a specific unit of analysis in a given situation. A more crucial
standard is its potential for elaboration and modification to accommodate
increasingly complex questions about the unit of analysis involved. The "role
as behavior in a status" would have been an appropriate organizing framework
if our interest had been limited to a description of such behavior and its
variability. This perspective would, indeed, have directed our attention to
performance in the student status and, therefore, would have been functional
to a descriptive objective. With student achievement considered as an indicant
or measurement of performance we could have described both the variability
within the sample and certain characteristics of that variability such as pat­
terns of central tendency and patterns of variability in terms of standard
deviations. A more ambitious objective of detecting associations between
types of student behavior and other variables might also have been served
by this tradition. We say might because, although this perspective would have
successfully guided us toward selecting which behaviors of children to study,
there is nothing inherent in it that provides guidance in selecting the other
variables to study. Neither is there anything inherent in it to enable us to
predict the nature or significance of any association detected. Still, had our
objectives been limited to such objectives this tradition of role-definition would
have been functional, though inefficiently so. In other words, the role defined
as performance tradition has great hueristic value if the objectives are descrip­
tive. We noted earlier that this tradition has tended to be associated with
If, however, our objectives go beyond description and association to the prediction of correlation, the role as expectations for behavior tradition becomes more appropriate. Correlations imply some character of relationship between variables such as temporal sequence or causation. This means, then, that in addition to describing variability we are attempting to develop an explanation of its sources and the dynamics of how these sources relate to the role-performance. Logically, we cannot use variations in performance to explain variations in the same performance. Hence, the tradition of defining role in terms of the expectations of others which are variables outside of and independent from the actual performance becomes not only more appropriate but the only feasible one for the objective. Notice, again, that this does not prohibit the use of role-performance as a legitimate independent variable when the conceptual and research objectives are different. If the referent or unit of analysis is the system or some characteristic of the system of which the status/role is a structural component, then actual role-performance may, depending on the nature of the question, be an important, independently varying contributor to the variation in the referent or unit of analysis. If, however, the role itself, its acquisition, adequacy, patterns of variation, etc., is the unit of analysis, then the sources of variation or correlates of patterns of difference must be sought outside the role-performance of the status encombent.

The expectational tradition postulates that the varying expectations of role-definners or significant role-audiences are one such outside source of predictable
variation in the definition and subsequent performance of a role. The corre-
lations found between different patterns of expectational emphasis and actual
role-performance supports this position and leads us to conclude that investiga-
tions of the content and hierarchical structure of role-expectations can con-
tribute to the understanding and explanation of variations in role-performance
and, further, the relationship between roles and how such relationships effect
role-performance.

The tradition of role definition that defines role on the basis of expec-
tations for appropriate behavior in a status is, we conclude, the most useful
for studying sources of variations in role-performance. It postulates that
varying expectations are an important variable; it identifies or at least
points us in the direction of identifying significant sources of expectations,
and, in Nadel's elaboration of the perspective, it begins to map the structure
and dimensions of the content of expectations. Despite this list of functions,
however, the tradition, as elaborated to this point, has not been completely
able either to describe or analyze the complexity of individual role-perfor-
mance or the interaction of roles. In partial alleviation of these shortcomings
we proposed a conceptualization of the dynamic nature of interaction between both
roles in a system and those who assumed these roles. We labeled this conceptual-
ization role-interface. To consider the conceptual or theoretical implications
of this dynamic and how it increases our understanding of role it is necessary
to move beyond the formulation used in this research, on the basis that this
formulation is tentatively found useful.

In addition to the historical issues already discussed which revolve around
the alternative definitions of role there are other issues involved in these alternative definitions. The role as performance tradition has, for instance, been criticized for the emphasis it places on the individual and his personality while concurrently failing to give sufficient consideration to the social systemic, cultural dimensions of role. In other words, it has been termed a psychological rather sociological conceptualization of role. The role as expectations tradition, on the other hand, has been criticized because it is presumably unable to deal with the attitudes, values, and norms an individual brings to any role and which, further, seem an obvious important variable in a role.

Proponents of both traditions are critical of each other on the grounds that the opposing tradition does not reflect either the complexity of role or the totality of its content. One tradition fails to stipulate dynamically the relationship between psychological characteristics and their social context and the other, it is claimed, has no potential for relating the social context to psychological characteristics of role-encumbents. It is implied that each presents an incomplete description of role-content and, particularly, in the case of the role as performance tradition, an incomplete exposition relating individual and society. Further, each suggests that part of the content attributed to a role by the other is inappropriate to a stipulation of the definitional properties of a role. Let us consider the contribution that our conceptualization of interface can make in clarifying and, hopefully, partially resolving these issues.

Let us begin by noting that Nadel's conceptualization of the structure of role provides a suitable basic framework for approaching the determination of
the content of role. Basic because, as we noted with reference to the student role, it is desirable to amplify and modify this basic framework in light of detailed knowledge of the role, if in fact, such knowledge exists. Given this basic framework, however, the issue of which source, individual or societal expectations, to tap for the property content of the role remains. The behavioral tradition, of course, will emphasize using Nadel's model to organize observations of individual behavior while dealing with expectations only as they are manifested as individual behavior through perception. The alternative expectational tradition, deals explicitly with these extra-individual characteristics and can use Nadel's model to organize observations of them to map the content of a role. At the same time, however, the characteristics, including idiosyncratic ones, of the individual find no satisfactory systematic treatment in this tradition - at least as we have developed it thus far. The problem, of course, stems from the fact that individual characteristics are not specific to the role and have an existence positionally and temporally external to role performance. Yet, those characteristics, as the performance tradition emphasizes, can and do influence the character and performance of a role. How can we and should we deal, for instance, with a case in which the individual contribution to a role, through creative performance, alters society's normative standards for what constitutes satisfactory role-performance.

Initially, we want to reiterate the point that roles refer to organized levels of behavior organized with reference to the functional exitencies of the system. The minimal standards or norms necessary to the performance of a
role and which define it, therefore, derive from extra-individual, social sources. In contrast to this we must stipulate that individual characteristics such as attitudes, values, aspirations - in sum, personality - enter into and effect role-performance in other than idiosyncratic ways. These positions, as stated, seem incompatible. This incompatibility, however, can be resolved by consideration of role-interface. It will be recalled that role-interface describes that dynamic dimension of role-interaction wherein the characteristics a category of role-assumers are variables in the structuring of a reciprocal role without being a part of the initial role from the standpoint of the expectational tradition. In this investigation it was shown how imputed characteristics of the student role influenced the teachers' implementation of their own roles, and in particular, the communication of their expectations for the student role. This interface that occurred between the teacher role and student characteristics was significantly correlated with variations in actual student role-performance. It illustrates the manner in which imputed characteristics, statuses - attitudes of those assuming a functionally contiguous role influences the content of ego's role through the mechanism of interface. This does not, however, exhaust the possibilities for introducing the individual and his traits into the interaction.

It will be recalled that the expected directionality in our findings did not materialize. It was suggested that this was due to the inadequacy of the

interface developing from the locus of the student. This suggests that, in addition to the perceived characteristics of a role-encumbent by role audiences, the actual characteristics are also crucial to role performance outcomes. Where one role or roles includes expectations congruent with and involving perceptions of characteristics realized in the object of their expectations a satisfactory - though not necessarily effective - role interface and role interaction prevail. We can see, then, that the individual and his own personality is a significant component of role-interface and role performance, though not a definitional component of the role, which is a systemic feature. The individual, whether the role-encumbent or one or many role definers, is introduced into the conceptual model through what we have termed the dynamic of interface.

Our discussion, thus far, does not fully describe interface's characteristics and potential utility. What we have said thus far indicates that we may use Nadel's model or some appropriate modification to organize our efforts at describing the structure of a role and inventoring its content. By developing a similar model regarding individual or categories of individual characteristics relevant to a role or roles and their interface we may similarly begin to assess the structural effects of interface. It bears mentioning, though it does seem self-evident, that interface is not restricted to the dyadic situation that has provided the basis for this investigation. In most cases, in fact, this would not be the case. Considering this, it becomes important that as the number of roles and role audiences and functional relationships among roles increase, the potential for inadequate, unsatisfactory, and
unsuccessful interfaces also increases - possibly geometrically. We would also note in passing that this possible geometric progression of opportunities for unsuccessful interface may account, in part, for the development of formal, bureaucratic organizations where role performance standards and relationships between roles are rationally and impersonally developed. The potential for unsatisfactory role performance inherent in taking into account the personal characteristics of large numbers of relatively unknown individuals is too great to permit successful functioning of the organization. It is, it seems to us, a matter of considerable theoretical interest to determine at what point in organizational development, either in terms of size or introduction of unfamiliar personnel, such a transition to an impersonal system of roles and role interfaces becomes a functional necessity. If the concept of interface expands our understanding of the nexus of the relationship of individuals it may also increase and expand our understanding of the complexity of relationships in large formal organizations.

In another facet of his model of roles, Nadel suggested that some of the content of a role was central or essential to the role, while other portions were either peripheral or totally irrelevant. This issues arises with respect to interface on two different levels. On one level what are the consequences of a variety of audiences differentially defining a role in regard to the centrality or peripherality of role content. Part of the distinction between the developmentalist and interventionist teachers was derived from their responding to the same characteristics of children differentially in terms of the centrality or peripheralness characteristics for the student role. Compound this consideration
by taking into account the other loci of the interaction and their definitions of centrality or peripheralness and another opportunity for conflict and unsuccessful interface emerges. A related issue has to do with the centrality or intensity of the interface itself in the interaction. What degree of interface is necessary under what conditions to initiate and successfully maintain role interactions and performance? Is there, for instance, a threshold effect level of interface which, once reached, is sufficient to lead to successful interaction and in which increments are relatively unimportant to the character of the interaction and performance of roles? Indeed, it seems to us that it might be questioned whether or not a level of interface could not be reached which was dysfunctional for role interaction in some instance. The military separation of "Command decision" personnel from the personnel we will have to engage in combat may be an example. Military leadership courses constantly stress the necessity for avoiding overly personnel relationships between staff who order potentially dangerous activities and the people who will have to carry those missions out. In our terms it suggests that if the awareness of the characteristics of reciprocal role incumbents reaches a certain level, the interpersonal relationships implicitly established could interfere with the performance of the roles.

Limitations and summary

Certain limitations to our findings and conclusions are apparent. The lack of previous test data on the children of the investigation prevents us from determining if varying expectational patterns would have had a differential
effect according to I.W. levels prior to contact with those expectations. Nor do we have any data on findings concerning middle-class children and how they might react to different expectational patterns. The unexpected directions of the findings with respect to the impact of expectations for the teacher role also points out the necessity for obtaining data from all dimensions of the interacting role-configuration. In this investigation it would have been particularly desirable to have had comparable data from the students at the very least and possibly from their parents. Finally, of course, there is a definite need to sample larger numbers of children and teachers to give non-appearing expectational patterns and non-appearing interface patterns a chance to be detected and assessed for impact if they do exist. Obviously we see a great deal of future research questions and research unitality in the concept of interface. Its very newness required that much of the discussion be framed in the form of questions. Its newness and lack of prior application and specification has resulted in a lower than desirable level of applications and measurement here and this limits the conclusions we might wish to draw from it. Despite these limitations, however, it is our feeling that certain conclusions are possible based on our findings.

The concept of interface, though young, has, we conclude, demonstrated a utility with reference to increasing both our conceptual understanding of the interaction of roles, personality, and social system and our ability to account for variations in role-performance. With respect to actual performance the findings indicate that varying patterns of expectational emphasis for the
student and teacher roles and the interface between these roles are correlated with student achievement. Teachers emphasizing attitude and skill development for the student role and who are developmentalist with respect to the teacher role are associated with students with significantly higher levels of achievement. Role interface, therefore, as a concept has demonstrated some theoretical power, by being of utility in this specific educational problem.
APPENDIX A

QUESTIONNAIRE
Dear

As you know the Grand Rapids Public School System has conducted a number of innovative and/or experimental pre-school and early elementary programs during the past two-three years. Samples of the children in these programs have been tested periodically for achievement, readiness, adjustment, etc. Results of these tests have provided information necessary to make decisions concerning retention, expansion, alteration, or elimination of the programs.

As useful as the information gained from testing children is, however, it really isn't enough on which to base future decisions. We also need the kind of information that can only come from the classroom teacher who must put the programs into effect and who deals, everyday, with children. The short questionnaire that you will find attached to this letter is intended to gather that kind of information.

Part I of the questionnaire asks your opinions about desirable abilities for children just completing a year of kindergarten. If you are a kindergarten teacher just coming to the end of the year with a group of children and in the process of evaluating them, this will be something you are thinking about currently. If you are a 1st. year teacher you are probably thinking now, or will be in a few months, about a new group of children just coming from kindergarten. If you are a pre-school teacher you are preparing to send children to kindergarten. We felt that this was a time of the year when you would be thinking about the topic of the questionnaire. In spite of the hectic pace of this time of year we ask your help in gathering much needed information.

There are three parts to the questionnaire and each part contains its own instruction for completion. Completion of Part III is optional but, from our point-of-view, very desirable. Accompanying the questionnaire there is an addressed return envelope. When you have completed the questionnaire place it in the envelope, seal it, and put it in the school mail. All of your answers will be confidential. In fact the form of the questionnaire, which may seem restrictive, was designed to permit statistical rather than personal analysis.

If you have any questions, call 456-4967. Thank you for your help.

Sincerely,

Orel D. Callahan
Principal Investigator

ODC:hc

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**PART I - Instructions:** Which one of the following pairs of abilities would you prefer children to have at the completion of a year of kindergarten? Check the one ability most desirable per pair even though both may be either desirable or undesirable.

<table>
<thead>
<tr>
<th></th>
<th>(a) Ability to act their age in the classroom.*</th>
<th>(b) Ability to play cooperatively with peers.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Ability to perform physical motor activities appropriate to age.*</td>
<td>(b) Ability to be away from parents without fear.+</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Ability to behave (relative to age) in manner appropriate to own sex.*</td>
<td>(b) Ability to initiate polite contact with unfamiliar peers.+</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Ability to perform physical motor activities appropriate to age.*</td>
<td>(b) Ability to accept situational rules.*</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Ability to behave (relative to age) in manner appropriate to own sex.*</td>
<td>(b) Opinion that school is worthwhile.*</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Ability to act their age in the classroom.*</td>
<td>(b) A positive attitude about guidance or correction.*</td>
</tr>
<tr>
<td>6</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(a) Ability to complete work or play tasks.*</td>
<td>(b) Ability to be away from parents without fear.+</td>
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<tr>
<td>7</td>
<td></td>
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<td>(a) Ability to initiate polite contact with unfamiliar peers.+</td>
<td>(b) Ability to follow instructions.*</td>
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<td>(a) Opinion that school is worthwhile.*</td>
<td>(b) Ability to play cooperatively with peers.+</td>
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<td></td>
<td>(a) Ability to be away from parents without fear.+</td>
<td>(b) A positive attitude about guidance or correction.*</td>
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<td></td>
<td>(a) Ability to accept situational rules.*</td>
<td>(b) Ability to initiate polite contact with unfamiliar peers.+</td>
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<tr>
<td></td>
<td>(a) Ability to perform motor activities appropriate to age.*</td>
<td>(b) Ability to maintain attention span.*</td>
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14. (a) Ability to behave (relative to age) in manner appropriate to (a) ____
   own sex.*
   (b) Ability to complete work or play tasks.°
   (b) ____

15. (a) Ability to follow instructions °
   (a) ____
   (b) Ability to act their age in the classroom.°
   (b) ____

16. (a) Opinion that school is worthwhile.°
   (a) ____
   (b) Ability to follow instructions.°
   (b) ____

17. (a) Ability to maintain attention span.°
   (a) ____
   (b) A positive attitude about guidance or correction.°
   (b) ____

18. (a) Ability to complete work or play tasks.°
   (a) ____
   (b) Ability to accept situational rules.°
   (b) ____

* - Items denoting physical development emphasis
+ - Items denoting social adjustment emphasis
° - Items denoting attitude development emphasis
- - Items denoting skill development emphasis

PART II - Instructions: In this section there are more paired statements. These, however, do not refer directly to desirable abilities in children. Instead they are concerned with curriculum content and methods for helping children achieve desired abilities. Again, please check the one statement in each pair that you most agree with.

1. (a) A teacher's major task is to allow students to develop their (a) ____
     basic capabilities.+ 
   (b) The amount a child learns is directly dependent upon the (b) ____
     ability of his teacher to modify the child's behavior.°

2. (a) While kindergarten-age children are ready to learn some (a) ____
     academic material and skills it is potentially harmful to 
   (b) Kindergarten age children, if they are ready to learn at all, (b) ____
     try and teach other things that are too advanced such as math, science, or reading.+ 
   (b) Kindergarten age children, if they are ready to learn at all, (b) ____
     are ready to tackle any academic material or skill if it can 
     be presented in the right way.°

3. (a) Children in kindergarten should not be taught reading and (a) ____
     language skills because most are not mature enough.+ 
   (b) Any child old enough for kindergarten is able to begin learn­ (b) ____
     ing academic skills such as reading and language, if teacher 
     works to foster these skills.°

4. (a) Kindergarten curriculums and teachers should provide all (a) ____
     children with the same experiences so that all children will 
     have an equal chance to develop according to each ones own 
     basic ability.+ 
   (b) Kindergarten teachers should be prepared to teach each child (b) ____
     differently to enable each child to learn necessary academic 
     skills.°
5. (a) Differences in children at the end of kindergarten mean that not all the learning needs of each of the children were met.\(^o\) (a) ___
(b) Differences in children at the end of kindergarten reflect innate differences in their abilities.\(^+\) (b) ___

6. (a) Certain traits or characteristics of children emerge automatically and neither teachers or curriculums should attempt to make children develop these traits before they are ready.\(^+\) (a) ___
(b) By the time a child is in school most desired traits or characteristics can be encouraged and brought about sooner by the right teaching methods and the right curriculum.\(^o\) (b) ___

7. (a) Children need a teacher who will work right along with them or else they may not learn.\(^o\) (a) ___
(b) Children will learn on their own if they are ready and the right conditions and materials are presented in an atmosphere conducive to learning.\(^+\) (b) ___

\(^+\) - Item denotes developmentalist emphasis
\(^o\) - Item denotes interventionist emphasis

PART III - Optional: It is quite likely that you have special information or opinions about children in this age group or the curriculums that are being used that were not covered in the first two sections of this questionnaire. If so, please use the remaining blank area to express, in your own words, any suggestions, criticisms, or other relevant comments.
### Deck - 1  
**TEACHER ATTITUDE STUDY**

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**TYPE OF PRE-SCHOOL PROGRAM**

- Item 3: 1 = structured 0 = other - B.E.  
- Item 4: 1 = unstructured 0 = other - enrichment  
- Item 5: 1 = control 0 = other - control

**TYPE OF KINDERGARTEN**

- Item 6: 1 = follow thru 0 = other - B.E.  
- Item 7: 1 = regular 0 = other - Reg.

**TEACHER ATTITUDE RESPONSES FROM QUESTIONNAIRE**

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**TEACHER EXPECTATIONS FOR PHYSICAL DEVELOPMENT**

1 = hi 0 = other

**TEACHER EXPECTATIONS FOR SOCIAL ADJUSTMENT**

1 = hi 0 = other

**TEACHER EXPECTATIONS FOR ATTITUDE DEVELOPMENT**

1 = hi 0 = other

**TEACHER EXPECTATIONS FOR SKILL DEVELOPMENT**

1 = hi 0 = other

**TEACHER EXPECTATIONS FOR SELF**

1 if behavior modificationist
0 if other

1 if developmentalist
0 if other

1 if inter.
0 if other

Deck # 1


Cantor, N., Dynamics of Learning, Henry Stewart, Inc., Buffalo, N. Y. (1961)


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