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Self-Concept and Reinforcement: Two Paths to Achievement for Black and White Elementary School Children

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SELF-CONCEPT AND REINFORCEMENT: TWO PATHS TO ACHIEVEMENT FOR BLACK AND WHITE ELEMENTARY SCHOOL CHILDREN

by

Kirby L. Throckmorton

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

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Kirby L. Throckmorton
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Chapter I

INTRODUCTION

Many experts in the fields of sociology, anthropology, psychology, and education continue to debate the issue of differences between black and white intelligence and achievement in U.S. society. This controversial issue has been recently heightened by Jensen (1969) who claims that in the standard distribution of I.Q. throughout the population the Negro is 15 points lower than the white. Moreover, Metropolitan Achievement Test results show blacks to enter grade one scoring lower than whites on reading and mathematics. Upon entering grade two, blacks are at a lower grade-level than whites; and, by grade nine, the initial discrepancy of a few tenths of a grade has increased considerably. Generally, gains made by whites during the school year are always greater than those made by blacks.

Coleman (1966) provides data to support the differential performance of whites and blacks on verbal and nonverbal tests. Why do these discrepancies exist and why do they increase as children progress (regress) through the same school system? Jensen has suggested that I.Q. differences are due to genetically based variance between blacks and whites, while other scholars have adopted a social pathological model which suggests that blacks are culturally deprived. A third view, proposed by the more radically oriented, suggests that major problems in the
larger social structure result in I.Q. and achievement discrepancies between blacks and whites.

This study, on a macro-level, focuses upon the latter of these three general orientations. Tersely, self-concept of blacks and whites will be examined as a function of reference group memberships and definitions of the larger society, specifically, the definitions of the majority group. Secondly, social structure will be examined as a reward system which differentially reinforces certain types of performances for blacks and whites. In other words, this study will attempt to explicate more precisely the relationships among achievement, self-concept, self-esteem, and the consequences of achievement for black and white elementary school children.

A review of the theory and relevant literature raised a series of pertinent questions. For example, is the self-esteem or self-concept of black and white students significantly different? What is the relationship between self-esteem, self-concept, and achievement? Is self-esteem or self-concept an intervening variable between reinforcement and achievement? Does a change in reinforcement produce a change in self-esteem or self-concept? Is there interaction between self-esteem, self-concept, and reinforcement? Do changes in reinforcement differentially affect the achievement, self-concept, or self-esteem of black and white students?

It should be pointed out that studies seeking to answer these types of questions are often rationalized on the basis of
wasted manpower and intellectual resources. This argument has not diminished in importance if the numerous unresolved social problems which face this society are considered. However, considering technological changes that have occurred, it is possible that U.S. society will not need a large portion of its population to carry on the process of producing goods and services in the future. If this end is realized, will a whole category of people, such as blacks, be eliminated from competition within this sphere or will the process be proportionately experienced by all categories of people within the United States? Given that these technological changes will require more rather than less competent people, the conclusion appears to be that a disproportionate number of blacks will continue to experience the negative effects of social change either unintentionally or by design. In order to counteract this process, blacks must be able to compete; and, a large portion of the ability to compete is a function of having received the best education possible. At the present time, I.Q. and achievement scores which are on the average lower for blacks than whites do not indicate that blacks are being educated to successfully compete.

BRIEF HISTORICAL BACKGROUND TO THE PROBLEM

Prior to 1954, the State of Kansas permitted cities of more than 15,000 in population to maintain separate school facilities for black and white children. A suit was brought against the Topeka Board of Education which maintained segregated elementary schools. The District court found that segregation has a detrimental effect
upon black children but did not decide in favor of the plaintiffs on the grounds that schools for blacks and whites were essentially equal. The case was appealed to the United States Supreme Court which eventually ruled in favor of the plaintiffs. The relevance of the decision for this study is in the rationale developed by Chief Justice Warren in support of the ruling. The written opinion refers to the Kansas court's conclusion that segregation of blacks and whites in public schools has a detrimental effect upon black children (U.S. Reports, 1953). Warren cited a number of references which were held to give ample support to the contentions of the Kansas court. These will be examined because they partially set the tone for this study.

There was a dearth of research on the psychological effects of enforced segregation upon black and white children compared to what is available now. It is questionable, however, whether the recent data would be any more effectively conclusive. Although, the court made specific reference to the later study by Clark (1950) and not to their earlier studies (1939; 1940), one can assume that their earlier studies affected Clark's 1950 statement. Hence, they will be considered as part of the "modern authority" drawn upon by the court.

The Clarks (1939) utilized sets of line drawings depicting black and white children in various types of activity. A sample of black and white children in segregated nursery schools in Washington, D.C. were asked to choose the person in each picture which they felt they were most like. The black boy was chosen
by 50.9 percent of the children and the white boy by 44.1 percent. The Clarks (1940) repeated the study with dolls as the objects to be chosen. Samples were drawn from segregated nursery schools in Arkansas and desegregated nursery schools in Massachusetts. They reported that children in the north made fewer identifications with the black doll and more identifications with the white doll than did the southern sample. Clark (1950:145) summarized the evidence by stating "this pattern of personal disabilities includes not only subjective feelings of inferiority, low self-esteem, ambivalent attitudes toward his own group, but also either overt or indirect hostility against both whites and Negroes."

This statement appears to accurately summarize the Clarks' position; but, it does not seem supportive of the proponents of desegregation since northern children in desegregated nursery schools were more likely to racially misidentify themselves. It is even less appropriate considering that northern children were more likely to break down and cry and become negativistic when the interviewer asked them to make a self-identification (Clark and Clark, 1940). Clark (1950) refers to an additional piece of empirical work by Tait (1946) who found that children of Italian born parents manifested character defects such as "inferiority feelings, awareness of rejection, poor social adjustment, introversion, and emotional instability: due to rejection."

Deutscher and Chein (1948) provided the court the results of a survey of anthropologists, psychologists, and sociologists. It was found that 90 percent felt that enforced segregation has
detrimental psychological effects on the segregated groups. These opinions were supported by general or anecdotal statements supplied by the respondents.

Brameld (1949) contributed an essay on the various economic and psychological costs of segregated education. Frazier (1949) provided a general statement concerning the negative effects of living in a segregated society on the black personality. He supported his statement by citing Bayton (1941) who found that blacks tend to idealize whites and apply racial stereotypes held by whites to themselves. Myrdal described the problems experienced by blacks in the area of education due to racism in the south and northern philanthropy. He stated that the ambition of black youth is restricted by the "low expectation from both white and Negro society" (Rose, 1964:218).

The studies cited above tended to emphasize two major foci: 1) the objective results of segregated education in the form of less money for black education which leads to poorer facilities, less pay for teachers, fewer supplies, and more outdated texts, and 2) the detrimental psychological effects. While it seems that the objective and psychological effects of enforced segregation upon children are obvious, the empirical evidence for such a conclusion was scarcity in 1954. Nevertheless, Chief Justice Warren found it supportive of the decision that "separate but equal" has no place in U.S. public education.

The notion that de jure segregation prior to 1954, de facto segregation since, and discrimination in general, negatively affects
minority group members psychologically still permeates the literature. A 1963 conference on "The Relationship of Education to Self-Concept in Negro Children and Youth" operated on the assumption that "in general, the environmental press of the American color-caste system tends to develop conceptions of self in Negro children and youth which result in defeated behavior, as far as academic and political development are concerned" (Patterson, 1965:2-3). The report continues by pointing out that if a child has a negative self-concept as a learner, then the task of the educator becomes almost impossible and children seldom exceed the expectations of their teachers.

Knowles and Prewitt (1969:34) contend that the combined effect of I.Q. testing, classroom ability grouping, and negative teachers' attitudes is a "progressive lessening of the child's self-esteem as he proceeds through school." Banks (1972) argues that the image of black Americans presented in teaching materials serves to further deflate a low self-concept already held by the black child.

Rosenberg and Simmons (1971:2) state: "If the black is treated as an inferior on grounds of his race or lack of success in the occupational or academic realms, then his sense of personal value should assuredly be low." Others who support this position include Clark (1965), Frazier (1957), Grier and Cobbs (1968), Kardiner and Oversey (1951), Proshansky and Newton (1968), and Pettigrew (1964). Specific research will be discussed later but the above statements imply that living in a racist society has
negative psychological effects on blacks.

There is an apparent hiatus between this literature and the large body of recent comparative empirical research on black and white self-concepts. Simple statements to the effect that blacks do not achieve as highly as whites because of their negative self-concepts are called into question since there is strong empirical evidence for a belief that the self-concept of blacks are actually higher than, or at least equal to, those of whites.

THEORY AND RELATED LITERATURE

This study is concerned with behavioristic and self-models of human behavior. Basically the operant paradigm views behavior as a function of its consequences. The probability that a given behavior will occur is a function of the manner in which it has been previously reinforced. The self-model attempts to deal with the mentalistic problem in that the answer to the why question is to be found in the mind, and the ultimate cause is essentially located within the individual. Skinner (1974:12) contends that "the mentalistic problem can be avoided by going directly to the prior physical causes while bypassing intermediate feelings or states of mind." In the self-model, these intermediate feelings or states of mind are of central importance rather than something which can be bypassed. Skinner in discussing methodological behaviorism suggests the following:

... consider only those facts which can be objectively observed in the behavior of one person in its relation to his prior environ-
mental history. If all linkages are lawful, nothing is lost by neglecting a supposed non-physical link (Skinner, 1974:13).

The rationale for using a self-model or any other kind of mediational approach is premised on the idea that even though all linkages are lawful a nonphysical link is required to successfully predict behavior.

Radical behaviorism, according to Skinner (1974), differs from methodological behaviorism in that the former acknowledges the possibility of self-observation or self-knowledge, the latter does not. The mentalistic psychologies severely restricted their consideration of external antecedent events. Radical behaviorism establishes some balance between a concern for external antecedent events and events that occur within the person. Skinner states the position as follows:

... what is felt or introspectively observed is not some nonphysical world of consciousness, mind, or mental life but the observer's own body. This does not mean ... that what are felt or introspectively observed are the causes of behavior. An organism behaves as it does because of its current structure, but most of this is out of reach of introspection. At the moment we must content ourselves, as the methodological behaviorist insists, with a person's genetic and environmental histories. What are introspectively observed are certain collateral products of those histories (Skinner, 1974:17).

Thus, self observations may be made of one's own body. In terms of the self-model, some of these observations might be classified as self-concept; but, from the viewpoint of radical behaviorism, these are merely collateral products of genetic and environmental histories and not causally related to subsequent behavior. In the
self-model, however, these observations are causally related to subsequent behavior.

Self Theory

Many studies of self are conceptually and operationally deficient. If the concept self is to have any scientific utility, it must be refined. Wylie (1968) points out that theorists include disparate ideas under one self-referent label, use different labels to refer apparently to the same idea, and are not consistent with other theorists in their usage of the concept self. Lowe (1961) articulates the diverse ways in which the concept self has been used.

What is meant by the concept self? William James (1890) defined the self as the sum total of all that a person can call his. Symonds (1951) defined the self as the ways in which the person reacts to himself. According to Snygg and Combs (1949:58) the phenomenal self "includes all those parts of the phenomenal field which the individual experiences as part or characteristics of himself." From the perspective of Carl Rogers, self denotes:

The organized, consistent conceptual gestalt composed of perceptions of the characteristics of the 'I' or 'me' and the perceptions of the relationships of the 'I' or 'me' to others and to various aspects of life, together with the value attached to these perceptions. It is a gestalt which is available to awareness though not necessarily in awareness. It is a fluid and changing gestalt, a process, but at any given moment it is a specific entity (Rogers, 1959:200).

Mead (1969:226) suggests that the self "arises in the process of social experience." The self is the organization of
experience into the experience of the self. More specifically,
"what makes the organized self is the organization of the attitudes
which are common to the group." The structure of attitudes makes
the self and is obtained by taking different roles available in
the community.

The concept self has been classified into two broad
categories: self-as-object and self-as-process (Wylie, 1968 and
Hall and Lindzey, 1970). The self-as-process idea defines the
self as a "group of psychological processes which govern behavior"
(Hall and Lindzey, 1970:516). Self-as-object refers to a "person's
attitudes and feelings about himself" (Hall and Lindzey, 1970:516).

This typology of "self-as-object" and "self-as-process"
does not result in mutually exclusive categories. Rentz and White
(1967) factor analyzed a number of variables assigned to either
self-as-object or self-as-process categories and found these two
categories to be less independent than suggested in the literature.
Secondly, theorists attribute motivation characteristics to the
self-concept or the ideal self-concept which means that self-as-
object has been moved into the category of self-as-process, thus
blurring the distinctiveness of the two categories.

A partial rationale for utilizing a self construct in
any model of human behavior is that individual behavior cannot be
currently predicted with any high degree of accuracy from a
combination of observable antecedent events external to the
individual and observable attributes of the subject (Wylie, 1968:
731). Therefore, what is needed, according to some theorists, is
a hypothetical construct, the self. The self is assumed to make some kind of contribution to the organism's response; otherwise, responses could be predicted without error from observable antecedent events. One should note, however, that the inability to accurately predict human behavior on the basis of observable antecedent events may be due to relatively unsophisticated observational procedures rather than the intervention of some hypothetical construct in the form of the self.

The contribution made by the self is a function of self-as-object. Snegg and Combs (1949:15) state that "all behavior, without exception, is completely determined by and pertinent to the phenomenal field of the organism." For the Meadian, the response is a function of the "Me" and "I". Attitudes of the community that have been internalized in the process of socialization constitute the "Me". The response to a situation as it appears in a person's immediate experience is uncertain; and, this makes up the "I". The "I" component partially accounts for the error which results from predicting individual responses solely on the basis of community attitudes.

Thus, for the purposes of this study, the self will be conceptualized as a person's cognitions and feelings, those psychological processes which influence behavior, and, the "I".

Self-Concept Theory

The self is a hypothetical construct which cannot be directly observed. Therefore, to salvage it as a scientifically
useful term, it needs to be conceptualized at a less abstract level so that it can eventually be measured. The first stage of this process involves looking at the notion of self-concept. Kinch (1972:246) defines the self-concept as "that organization of qualities that the individual attributes to himself." According to Fitts (1971:3) "perceived self is one individual's self-concept." From Rogers:

The self-concept or self-structure may be thought of as an organized configuration of perceptions of self which are admissible to awareness. It is composed of such elements as the perceptions of one's characteristics and abilities; the percepts and concepts of the self in relation to others and to the environment; the value qualities which are perceived as associated with experience and objects; and goals and ideals which are perceived as having positive or negative valence (Rogers, 1951:136).

Thus, self and self-concept are not isomorphic. The self-concept is an abstraction including only those aspects of the self that are experienced, perceived, or admitted to awareness by the person. The utility of the self-concept, in terms of prediction, is reduced since it does not embrace the full range of events included in the concept self, nor does it allow for misperceptions, biased experiential activity, or differential admission of events from the self to awareness.

Up to this point, self and self-concept have been considered in a generic sense. A second step in the process of refining the definition of self involves differentiating various components of self-concept. Symonds (1951) views the self as consisting of four aspects: perceptions, cognitions, evaluations, and how one person attempts through action to enhance or defend himself. Mead (1969),
James (1890), Akeret (1965), and Coopersmith (1967) also view the self-concept as being multidimensional.

Wylie (1968) uses the notion of the generic self-concept to refer to the inclusiveness of the self-concept. Conceptually, she suggests subdividing generic self-concept into actual-self-concept and ideal-self-concept. She further subdivides actual-self-concept into social-self-concepts corresponding to different social roles and private-self-concepts. Ideal-self-concept is subdivided into own-ideal-self-concepts and concepts of others' ideals for one. With respect to social-self-concepts, the basis for evaluation is a comparison of the specific social-self-concept which is actually the person's perceptions of that specific self with own-ideal-self-concepts and concepts of others' ideals for one.

In summary, the self is conceptualized as a person's cognitions and feelings, psychological processes, and the "I". Self-concept is conceptualized as the person's perceptions of these various aspects of the self. Self-concept, "in turn, guides or influences the behavior of that individual" (Kinch, 1972:246). The relationships between responses of other, self-concept, and behavior of the individual is contained in three postulates:

1. The individual's self-concept is based on his perceptions of the way others are responding to him.
2. The individual's self-concept functions to direct his behavior.
3. The individual's perception of the responses of others toward him reflects the actual responses of others toward him (Kinch, 1972:246).
Self-Esteem

It has been indicated that the self and self-concept are multidimensional. Given the costs of doing research, one might ask whether certain dimensions might not be more salient than others. In terms of predicting behavior, should the emphasis be placed upon the person's evaluation of his generic-self-concept, specific-self-concept, specific-self-concept most closely related to the behavior in question; or, should the person's self-concept be focused upon regardless of his evaluations? Coopersmith (1967) and Rosenberg and Simmons (1971) have chosen to focus upon the evaluative dimension of self-concept conceptualized as self-esteem. The literature supports an association between self-esteem and a number of other variables. The basic question is this: why do different levels of self-esteem result in different types of behavior? Coopersmith (1967), Branden (1969), and Rosenberg and Simmons (1971) provide the more recent statements; but, a theoretical discussion of self-esteem as an independent and intervening variable necessarily must start with William James.

James (1890) divided the history of self into three parts: 1) the constituents of self made up of the material self, social self, spiritual self, and pure ego; 2) self-feeling; and 3) self preservation and self seeking. These latter two aspects are especially relevant for a deterministic analysis of self-esteem. Self-feeling is subdivided into self-complacency and self-disatisfaction. According to James (1890:306), there is a "certain average tone of self-feeling which each one of us carries about
with him, and which is independent of the objective reasons we may have for satisfactions or discontent." However, the "normal provocative of self-feeling is one's actual success or failure."

Certain empirical selves are mutually exclusive, in the sense, that a certain self can be realized only when others are more or less suppressed. The person chooses one self for his own which become his reality. Successes and failures related to this self are real and carry with them gladness and shame. According to James, shame and gladness can come from only those selves adopted as one's own. Self-feeling "depends entirely on what we back ourselves to be and do" (James, 1890:310).

Cooley conceptualized "self" as that which is designated in common speech by the pronouns of the first person singular. His focus is the empirical self, or "the self that can be apprehended or verified by ordinary observation" (Cooley, 1964:168). For Cooley, the feeling aspect of the self is the immediate and decisive sign and proof of what the "I" (the empirical self) is. "Gloating" captures for Cooley the meaning of "self-feeling of a reflective and agreeable sort . . ." (Cooley, 1964:174). Successful purposeful activity leads to gloating, positive self-feeling, especially if the activity is praised. Self-feeling of resentment and humiliation may result if fault is found.

Self-feeling results from "the imagination of our appearance to the other person" and "the imagination of his judgment of that appearance." Self-feeling is associated with motivation as follows:
With all normal and human people it (self-feeling) remains, in one form or another, the mainspring of endeavor and a chief interest of the imagination throughout life (Cooley, 1964:208).

Branden (1969) states that there is "no value-judgement more important to man . . . than the estimate he passes on himself." This estimate is generally constantly experienced in the form of a feeling which is part of every other feeling; and, it is involved in man's every emotional response. Self-esteem has two interrelated components: a sense of personal efficacy, and, a sense of personal worth. Self-confidence primarily results from cognitive efficacy. A second type of efficacy refers to a person's effectiveness in particular areas of endeavor which results from specific acquired knowledge and skills. An individual's sense of personal worth is a function of his judging himself by some standard. Personal worth decreases according to the extent that a person fails to satisfy that standard.

Branden identifies self-esteem as an independent variable: "... productive achievement is a consequence and expression of healthy self-esteem, not its cause" (Branden, 1969:123).

Self-esteem to Coopersmith is:

The evaluation which the individual makes and customarily maintains with regard to himself: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy. In short, self esteem is a personal judgement of worthiness that is expressed in the attitudes the individual holds toward himself (Coopersmith, 1967:4-5).

Self evaluation is a judgemental process whereby an individual examines his performance, capacities, and attributes.
according to his personal standards and values; and, arrives at a
decision regarding his personal worthiness. This comparison process
results in self-attitudes which may be defined and examined in the
same manner as attitudes toward objects other than the self.
Attitudes are an "orientation toward or away from some object or
event and a predisposition to respond favorably or unfavorably
toward these and related objects and events" (Coopersmith, 1967:7).
It is presumed that self-attitudes, like other attitudes, carry
positive and negative affective connotations which are interrelated
with cognitive and motivational processes.

Research on attitudes indicates that they "engender a
readiness to respond to particular stimuli along predetermined lines."
Attitudes may be indicative of what an individual expects will happen
to him in new situations. Expectations of success may result in a
confident stance while expectations of failure may result in
apprehension, anxiety, and lack of persistence. It is presumed that
a person's probability estimates of success reflect his conviction
that he is or is not able to deal with the situations that are
encountered.

It appears reasonable to assume that persons with
negative self-attitudes would place different values
on social participation and enterprise than would
persons who held a more favorable view of their
worthiness. It is also likely that persons who
regard themselves negatively will be inclined to
be introverted and passive in adapting to environ-
mental demands and pressures. Those who place a
higher value upon themselves will adopt a more
active and a assertive position (Coopersmith,

In summary, an individual's self-esteem emerges from a
comparison of actual-self-concept to ideal-self-concept. Self-esteem, in turn, influences the behavior of that individual. The relevant relationships are contained in the following postulates:

1. "The individual's self-concept is based on his perceptions of the way others are responding to him."
2. The individual's self-esteem is based on a comparison of the way others are responding to him (actual-self-concept) and his ideal-self-concept.
3. The individual's self-esteem functions to influence his behavior.
4. The individual's self-esteem reflects the actual responses of others in the immediate situation (actual-self-concept) and the responses of significant others (ideal-self-concept).

Operant Paradigm

Any behavior that is weakened or strengthened by the events that occur subsequent to the response is referred to as an operant (Reese, 1966 and Skinner, 1966). Operant conditioning involves providing certain consequences contingent upon the performance of the behavior such that the behavior is more likely to occur again. Reinforcement "designates simply the strengthening of a response." There are two classes of reinforcers: a particular consequence is said to be a "positive reinforcer if the frequency of responses of a given class increases when the presentation of the event is made contingent upon a response of that class" (Morse, 1966).
If the removal of an event contingent upon a response increases the frequency of responses of an operant, the consequence is said to be a negative reinforcer.

"A schedule of reinforcement is the prescription for initiating and terminating stimuli, either discriminative or reinforcing, in time and in relation to responses" (Morse, 1966). Behavior may be reinforced according to a number of different schedules including continuous reinforcement where every response is reinforced, various intermittent schedules such as fixed or variable ratio where reinforcement is a function of response frequency, or fixed or variable interval in which reinforcement is a function of response frequency, or fixed or variable interval in which reinforcement is a function of time. More complex schedules may be structured from these basic ones.

Ratio of responding is the basic datum in the study of operant behavior primarily because of its methodological simplicity. Where an accumulative record is maintained, rate and changes in rates of responding are "visible at a glance over substantial periods of time" (Skinner, 1966). The rate of responding should not be considered as the end datum. Scientists would like to know why the organism responds at a certain rate or why the rate of responding does or does not change over time. According to Skinner:

What is required is an analysis of the conditions which govern the probability that a given response will occur at a given time. "...the prediction and control of behavior call for an evaluation of the probability that a response will be emitted (Skinner, 1966:16)."
The utility of the response rate as a basic datum is that rate and changes in the rate are "directly observed, they have dimensions appropriate to a scientific formulation, and under skillful experimental control they show the uniformity expected of biological processes in general" (Skinner, 1966:16-17).

This research will be concerned with ratio of correct responses rather than response rate since number of responses possible and time available for making responses are restricted by the situation. Explanation involves specifying those conditions that produce a correct response rate rather than a particular rate of responding. This procedure is a possible extension of Skinner's basic statement and is supported by several experiments to be discussed later. These show that when quality of performance is reinforced quality increases whereas if quantity of responses is reinforced then quantity increases.

HYPOTHESES

The research design, which is described in Chapter II, was developed in order that fourteen related hypotheses could be tested. Several of the hypotheses focus upon zero order relationships. While this is an acceptable way to examine interrelationships among variables, it is believed that a better understanding can be obtained through the use of multivariate procedures. Therefore, the final section of this chapter will propose a model which will consider each of the hypothesized zero order relationships simultaneously. The hypotheses will be listed and subsequently discussed.
1. The self-esteem of black elementary school students is greater than that of whites.

2. The self-concept of black elementary school students is greater than that of whites.

3. There is a positive relationship between self-concept and academic achievement.

4. There is a positive relationship between self-esteem and academic achievement.

5. The implementation of a reinforcement program in the classroom setting will produce an increase in academic performance.

6. The implementation of a reinforcement program in the classroom setting will produce an increase in self-concept.

7. The implementation of a reinforcement program in the classroom setting will produce an increase in self-esteem.

8. Reinforcement will have a differential effect upon achievement given different levels of self-concept.

9. Reinforcement will have a differential effect upon achievement given different levels of self-esteem.

10. Reinforcement will have a differential effect upon the self-esteem of black and white elementary school pupils.

11. Reinforcement will have a differential effect upon the self-concept of black and white elementary school pupils.

12. Reinforcement will have a differential effect upon the achievement of black and white elementary school pupils.

13. Self-concept operates as an intervening variable between the behavior of others and the student's achievement.

14. Self-esteem operates as an intervening variable between the behavior of others and the student's achievement.

**Black and White Self-Esteem**

The first objective is to ascertain whether the self-esteem and/or self-concept of black and white students is significantly different.
Hypothesis One: The self-esteem of black elementary school students is greater than that of whites.

Hypothesis Two: The self-concept of black elementary school students is greater than that of whites.

First, there are a number of studies which show blacks to have higher self-esteem and self-concept scores than whites.

Rosenberg and Simmons (1971), Wendland (1967), Zirkel and Moses (1971), Storm (1971), Strong (1973), Kuhn (1973), and Attenborough and Zdep (1973) all provide empirical evidence to suggest that black children have higher self-esteem than white children. Second, research exists to show that white children have higher self-esteem than black children (Long and Henderson, 1968; Bridgette, 1970; Gordon, 1969; and Deutsch, 1960). Finally, there is empirical support for the conclusion that there is no difference between the level of self-esteem of black and white children (Healey, 1970; McElroy, 1971; White and Richmond, 1970; Sisenwein, 1970; and Coleman, 1966). These variant findings may be due to a number of things including sampling and scale construction. Possibly more precise findings might result from the use of more sophisticated measures of self-esteem than were utilized in the studies discussed so far.

When multidimensional instruments are utilized to measure self-esteem, blacks are found to score higher on some dimensions than whites and lower on others. For example, McDonald and Gynther (1965) found black high school seniors to score higher in terms of dominance and love scores derived from the Interpersonal Checklist, while white scored higher on ideal-self descriptions.
Other comparative research on the self-esteem of black and white youth using multidimensional scales also shows blacks to score higher on some subscales and lower on others (Douglas, 1970; Sisenwein, 1970; Healey, 1970; and Storm, 1971). This research indicates that global self-esteem scores for blacks and whites varies as a function of the structure of the instrument.

The rationale for this hypothesis is provided by previously discussed theoretical statements and empirical work. First, in terms of Mead and Cooley, it needs to be asked, who is the significant other in the black child's life? When the black child imagines his appearance to the other person, who is the other person? What is the reference group for the black child? The obvious answer seems to be black parents, black siblings, and black peers just as the answer would be white parents, white siblings, and white peers for white children. The direct influence of whites on black self-esteem is largely irrelevant until black children begin to interact with whites. Even then, the influence continues to be a function of the extent to which blacks function as significant others or as a reference group. How do black parents react to black children? How are they socialized? The relevant point, for the development of this argument, is that they learn how to live in a prejudiced, discriminating, and racist society. Survival requires certain types of adaptations to the larger society which center around an adequate reality orientation. One of the realities being that frustration, failure, and discrimination is part of life. This is suggested by McDonald and Gynther (1965), where blacks were found to score higher
than whites on actual self descriptions but lower on ideal self descriptions. In this case, blacks perceived themselves as doing somewhat better than whites; but, they had adopted lower ideals, ideals which were more realistic for their world.

If James' formula that self-esteem is the ratio of success to pretensions is considered and the assumption of adopting ideal goals consistent with the reality of living in a racist society is made, pretensions should be lower. If pretensions are kept at a low level, then small successes are sufficient to maintain relatively high levels of self-esteem.

Another point can be made with respect to the work of Coleman (1966), Branden (1969), and Baughman (1971). Coleman found that achievement was a function of perceived control over environment. Branden contends that existential achievements are a function of a number of things not exclusively controlled by the person; and, that it is dangerous to a person's self-esteem to let his sense of personal worth depend on factors beyond his control. Baughman (1971) has argued that blacks can maintain their self-esteem because personal problems are seen as a function of the racist system rather than personal deficiency. Thus, by viewing the racist social structure in a deterministic fashion it becomes possible to maintain higher levels of self-esteem than would be possible if a person accepted personal responsibility for all that happened.

James contends that some selves are relevant and others are not. If change is to be produced in self-esteem, then successes must be manipulated with respect to those selves which are personally relevant. Most likely a person has high pretensions and successes
in those areas of the self which are relevant and low pretensions and successes in those areas that are irrelevant. In comparisons of black and white global self-esteem it may be the same for both; but, the selves on which self-esteem is based may be extremely different. Also, self-esteem may be the same, not because different selves are involved, but because one group may generally have low successes and pretensions and the other may have high successes and pretensions.

Self-Esteem and Achievement

The second objective of this study is to determine the extent to which self-esteem is related to achievement.

Hypothesis Three: There is a positive relationship between self-concept and academic achievement.

Hypothesis Four: There is a positive relationship between self-esteem and academic achievement.

Related to these hypotheses is the issue of whether self-concept and self-esteem can be affected by self-concept enhancement procedures.

A considerable body of research exists to support a positive relationship between self-concept, self-esteem, and academic achievement such as grade point average, reading achievement, class grades, etc. (Brookover, et. al., 1964; Brookover, et. al., 1967; Wattenberg and Clifford, 1964; Epps, 1969; Coleman, 1966; Rosenberg and Simmons, 1971; Lang, 1971; Singh, 1973; Sidawi, 1971; Nelson, 1971; Cummings, 1971; Kern, 1971; Miller, 1971; Frerichs, 1971; Lewis, 1971; Padelford, 1970; Morrison, et. al., 1973; Goodman, 1971;
Krupczak, 1973; and Kunce, 1972). Relatively unique findings of no relationship between self-esteem and achievement are reported by Butcher (1968), Stillwell (1966), and Williams (1973). Pointedly, whether a relationship is found to exist is a function of the instrument used. For example, Stillwell (1966) found no relationship between global self-concept and achievement. However, she did find significant positive relationships between student self-concept and achievement, self-concept as reader and achievement, and self-concept as math student and achievement. Generally, the positive relationship between self-concept and self-esteem and achievement is not totally eliminated when other variables are controlled (ethnic background, SES, sex, I.Q., and so forth).

Rationale for the hypothesized relationship between self-concept and academic achievement can be found in Mead and others. From a Median viewpoint, the self is obtained through a process of taking different roles available in the community. Brookover and Gottlieb delineate how self-concept and achievement are related:

We postulate that the child acquires, by taking the role of the other, a perception of his own ability as a learner of the various types of skills and subjects which constitute the school curriculum. If the child perceives that he is unable to learn mathematics or some other area of behavior, this self-concept of his ability becomes the functionally limiting factor of his social achievement. "Functional limit" is the term used to emphasize that we are speaking not of genetic organic limits on learning but rather of those perceptions of what is appropriate, desirable, and possible for the individual to learn. We postulate the latter as the limits that actually operate, within broader organic limits, in determining the nature or extent of the particular behavior learned (Brookover and Gottlieb, 1964:469).
Implicit in this statement is the question of whether the role under consideration is appropriate for a specific person. That is, with respect to racist ideology, are academic roles appropriate for blacks but because of believed genetic inferiority socially defined "functional limits" are lowered accordingly? Or, are blacks deemed to be inappropriate occupants of academic roles and therefore discouraged through whatever means from occupying such roles?

Segregated education provides an academic role for blacks that is different from the one reserved for whites. Role definition, then, affects how those who occupy the role will perform. Hypothesis three suggests that those children who occupy an academic role and who perceive that they are expected to achieve in this role at relatively high levels will score much higher on achievement measures than those who do not perceive that they are expected to perform at very high levels.

Hypothesis four regarding self-esteem and achievement considers the evaluative dimension of self-concept. A person may approve of the relationship between actual and ideal self-concepts which indicates that he is capable, significant, successful, and worthy. A positive self-attitude reflects a person's conviction that he is strong and superior, that his opinions are worthy of expression, and that he can affect his environment. With respect to the academic role, a person has an actual and ideal self-concept. Depending on the relationship between actual and ideal self-concepts, the person may experience varying degrees of self-esteem. The person who has low self-esteem does not have the confidence that he can
adequately perform the behavior in question. Thus, the person is
led to do poorly on academic achievement measures simply because
he has negative self-attitudes about his ability to perform.

The problem with self-esteem and achievement is predicting
the behavior of a person with low self-esteem. He may give up,
drop out, or withdraw. Compensatory behavior may be developed
(i.e. the student may work extra hard to meet his ideals). Pre­
tensions may be lowered to match more closely successes. The
particular self in question may be dissociated or ranked at the
bottom of the hierarchy of selves. The person may deny that the
existence of a discrepancy between actual and ideal self-concept
is his personal responsibility and adopt a defensive measure.

Assuming that self-concept, self-esteem, and achievement
are related, can self-concept and self-esteem be changed such that
subsequent changes in achievement will be effected? The research
generally suggests that it is possible to change a person's self­
concept and self-esteem (Brookover, et. al., 1965; Birr, 1969;
Prows, 1968; Franco, 1971; Gillham, 1967; Hunt and Hardt, 1969;
Nails, 1971; Bradford, 1973; Schulman, 1973; Sallade, 1972; and
Felker, et. al., 1973). One exception is reported by Williams
(1973) who found a significant loss in student self-concept in a
program in which teachers were prepared to act as change agents
by helping the child to eliminate or reduce factors that limit
learning. These studies with few exceptions lead to the conclusion
that a child's self-concept can be changed by the implementation
of a variety of programs.
Reinforcement and Achievement

The third objective of this study is to ascertain the relationship between reinforcement and achievement.

Hypothesis Five: The implementation of a reinforcement program in the classroom setting will produce an increase in academic performance.

There is a large body of research which reports the successful use of behavior modification procedures in the classroom to change undesirable behaviors (e.g., being out of one's seat, inattention, talking, etc.) and academic performance. Academic performance has been improved in mathematics, spelling, reading, history, and geography (Reynolds, Light, and Mueller, 1973; Lovitt, Guppy, and Blattner, 1973; Lovitt and Esvedt, 1970; Whitlock and Bushell, 1967; Carlson, 1971; Axelrod, Whitaker, and Hall, 1972; Runnels, et. al., 1972; McLaughlin and Malaby, 1972; Miller, 1971; and Glynn, 1970). Byrnes (1973) compared the reinforcement patterns of teachers with respect to slow learners and randomly selected controls. The proportion of positive reinforcers given to slow learners for correct behavior was found to be significantly less. One exception to the generally positive results is Benson (1970) who found no significant differences in reading test scores of two control classes and two experimental classes which received 60¢ a week for "A" grades on written and oral assignments with a 15¢ decrement for each descending grade level. With few exceptions, the research overwhelmingly supports a functional relationship between reinforcement and academic performance.
The above research is concerned with nonverbal reinforcement in the form of points, tokens, free-time, candy, and so forth. There is also research on verbal reinforcement as it relates to achievement which is also relevant in that it provides a possible link between the reinforcement and self-models. Clark and Walberg (1968), Copeland, Brown and Hall (1974), Taffel, O'Leary and Armail (1974), Bass and Ninios (1974), and Chadwick and Day (1971) all report an increase in academic performance when nontangible reinforcement programs were implemented. Lowe (1973) and Bennie (1970) report the unsuccessful use of verbal reinforcement to significantly improve achievement behavior. While there are some exceptions, the literature generally supports the notion of a functional relationship between verbal reinforcement and achievement.

Reinforcement and Self-Concept

The fourth objective of this study is to ascertain whether a change in reinforcement produces a change in self-concept and/or self-esteem.

Hypothesis Six: The implementation of a reinforcement program in the classroom setting will produce an increase in self-concept.

Hypothesis Seven: The implementation of a reinforcement program in the classroom setting will produce an increase in self-esteem.

Research exists to substantiate a direct functional relationship between reinforcement and self-concept. Vidobeck (1967) notes that self-conception is frequently operationalized as a "set of inter-related self-ratings" which can be divided into
ideal-self ratings and actual self-ratings. Actual self-ratings are defined as "reinforced scale responses." It is assumed that a person selects a point on the self-rating scale based on informational cues received from others. Helper (1955) views the self-concept as consisting of those symbolic responses associated with the individual's identity symbols. Self-concept is a result of verbal learning. Various adjectives come to be tied in with a person's identity through reinforcement. It has been demonstrated that self-concept can be improved through various types of reinforcement procedures directed specifically at the self-concept (Haas and Maetir, 1965; Nuthman, 1957; Sopina, 1971; Flowers, 1973; and Stein, 1968).

There appears to be at least two ways in which reinforcement and self-concept may be related. One relationship is relatively direct in that the self-concept is a set of symbolic responses; and, a person is either reinforced or not reinforced for making certain symbolic responses concerning himself. In this instance, symbolic responses associated with self-concept are similar to any other operant. A second relationship is more indirect in that self-concept is a byproduct of the stimulus-response sequence. In this case, behavioral responses are contingently reinforced; and, as an indirect result of this process, the self-concept is affected.

A major portion of this study centers on the possible relationships between reinforcement and self-concept. The direct relationship between reinforcement and self-concept fits into the operant psychology framework. The indirect relationship fits into
the self-model more closely. In the latter, self-concept is a function of past reinforced performances and plays an important role in organizing future performances.

Self-Concept and Reinforcement Interaction

The fifth objective is to ascertain whether self-concept and/or self-esteem interact to produce differential levels of achievement.

Hypothesis Eight: Reinforcement will have a differential effect upon achievement given different levels of self-concept.

Hypothesis Nine: Reinforcement will have a differential effect upon achievement given different levels of self-esteem.

Gelfand (1962) suggests an interaction effect with respect to verbal operant conditioning. Subjects were initially placed in high and low self-esteem groups. These groups were divided and subjects experienced a success or failure condition designed to raise or lower self-esteem. It was found that "subjects exposed to experiences inconsistent with their customary self evaluations showed significantly more verbal conditioning than did subjects whose experiences were consistent with their self attitudes" (Gelfand, 1962:264). A test for interaction between initial self-esteem and experimentally varied self-esteem on performance was found to be significant. This finding suggests that children with low self-esteem would be expected to make greater gains in achievement than those with high self-esteem. This assumes that reinforcement would be discrepant with their level of self-esteem and thus they would be more susceptible to improvement.
Race and Reinforcement Interaction

The sixth objective is to ascertain whether changes in reinforcement differentially affects the self-esteem, self-concept, or achievement of black and white pupils.

Hypothesis Ten: Reinforcement will have a differential effect upon the self-esteem of black and white elementary school pupils.

Hypothesis Eleven: Reinforcement will have a differential effect upon the self-concept of black and white elementary school pupils.

Hypothesis Twelve: Reinforcement will have a differential effect upon the achievement of black and white elementary school pupils.

Literature has previously been cited which suggests that there is no difference in black and white self-esteem and self-concept. Assuming that this is true, self-concept and self-esteem cannot be used to account for the lower level of achievement of blacks compared to whites. A possible explanation of the lower level of achievement of blacks is that the social structure differentially reinforces certain types of performances for blacks and whites.

A suggestion as to what might be expected to happen when a reinforcement program is implemented with respect to race is provided by Coleman (1966). The suggestion is more in the form of an analogy since white and advantaged and black and disadvantaged are not synonymous.

Coleman (1966) found achievement to be closely related to the self-concept of children from advantaged groups but not those from disadvantaged groups. He found that achievement of disadvantaged
children is a function of their beliefs about their environment. It is assumed that disadvantaged children view the distribution of rewards by those in the environment as a function of the environment and not as a consequence of their own action.

These findings suggest that if rewards are made contingent upon the students performance rather than the benevolence of the environment, then, change in performance could be expected. This change in achievement is expected to be differentially experienced since the advantaged are already being reinforced for their performance, whereas, contingent reinforcement would be a new experience for the disadvantaged resulting in higher levels of achievement. Because the advantaged are already being reinforced additional reinforcement may have a satiating effect whereas the disadvantaged may be relatively deprived in terms of reinforcement and the behavioral consequences may be reinforcing. The implementation of a reinforcement program should result in increased achievement for those who are relatively disadvantaged but not for the relatively advantaged.

Thus, assuming that the lower achievement of blacks is due to differential reinforcement rather than lower self-concept and/or self-esteem, then, the contingent reinforcement of the performance of black children should increase their performance. If blacks indeed are being reinforced at a lower level, then, the implementation of a reinforcement program should have a greater effect on black than white academic performance since it is assumed that white pupils are already being reinforced at a higher level than blacks.
Self-Concept as an Intervening Variable

The seventh objective of this study is to determine whether self-concept and/or self-esteem function as intervening variables between stimuli in the environment and achievement.

Hypothesis Thirteen: Self-concept operates as an intervening variable between the behavior of others and the student's achievement.

Hypothesis Fourteen: Self-esteem operates as an intervening variable between the behavior of others and the student's achievement.

Brookover and Gottlieb state:

... the self is the intervening variable between the normative patterns of the social group or the role expectations held by significant other, on one hand, and the learning of the individual on the other. We hypothesize that, for the expectations of others to be functional in a particular individual's behavior, they must be internalized and become a part of the person's conception of himself (Brookover and Gottlieb, 1964:469).

Kinch's (1972) paradigm includes a stimulus (actual response), and an intervening variable (self-concept) which aids in constructing the act. Brookover, et. al. (1965) advanced the proposition that self-concept of academic-ability functions as an intervening variable between future performance and the past perceived evaluations of others. Evaluations of parents were changed in order to produce changes in their child's perceptions of self as achiever. They in turn examined grade point average and discovered that it had significantly improved, thus, supporting the contention that self-concept functions as an intervening variable between evaluations and grade point average.

Nalls (1971) and Smith and Brahce (1963) found that the
achievement of children could be affected by programs aimed at improving the children's self-concepts. Prows (1968) reports that an individual approach to instruction and sensitizing the teacher to building positive self-concepts produced a significant change in children's self-concepts. But no significant difference in reading achievement of the experimental and control groups resulted. There is, therefore, some empirical support for the hypothesized relationship between self-concept and/or self-esteem, response of others, and academic behavior.

Primary concern, prior to this section, has been with zero order relationships. For the purposes of this study, a more sophisticated model is required. Three major related questions arise from the previously discussed empirical and theoretical work which are considered to be unanswerable on the basis of zero order analysis. They are: 1. Does reinforcement produce simultaneous changes in self-concept and/or self-esteem and achievement? 2. Does reinforcement produce a change in both but at differential rates (i.e., reinforcement changes achievement in one day and self-concept and/or self-esteem in three days)? 3. Does reinforcement produce a change in self-concept and/or self-esteem which then produces a change in achievement? (Note the similarity to 2. The effect is the same as reinforcement producing a differential rate of change in both.)

Path models will be developed and utilized to test hypotheses thirteen and fourteen and to attempt to answer the questions posed above.

Concerning sex, McDonald and Gynther (1965), Larkin (1972), Healey (1970), Soares and Soares (1972), and Sweely (1970) all report differences in self-concept between boys and girls; although, these differences were not always significant. Negligible or no differences are reported by Padelford (1970), Coopersmith (1967), and Trowbridge, Trowbridge, and Trowbridge (1972).

Assuming that there may be an association between achievement, sex, SES, self-esteem, and self-concept, hypotheses thirteen and fourteen will also be tested utilizing path models which control for sex and SES.
CHAPTER II

METHODOLOGY

Sampling Procedure

Elementary students in the Grand Rapids Public School System were selected as the population to be studied. Selection of the sample was based upon certain theoretical and measurement requirements. Students were required to be at least in the third grade at the beginning of the study. This was done to insure the selection of students who could cognitively and symbolically handle the self-esteem instrument. Second, to insure a sufficiently large subsample of blacks for analytical purposes, schools with the highest proportion of black students enrolled were selected. Third, it was desired that some minimal controls be established such that the schools included in the study be located in areas with relatively similar characteristics. The final consideration was the willingness of the classroom teacher and principal to participate.

A nonprobability sampling procedure was utilized. Quota sampling insured that the black subsample would be large given the racial balance in the schools. It was purposive in that only students with a certain level of cognitive development were utilized. Of the above criteria, the most important for the purposes of field experimental research is the cooperation of teachers and principals. Ideally, random sampling with random placement of subjects in
experimental and control groups should be utilized. However, the exigencies of field experiments do not always permit the realization of the ideal as indicated by the present discussion of sampling and the later discussion of design.

There are fifty three elementary schools in the Grand Rapids Public School System. Of these, ten had more than 20 percent black enrollment. One of these had a large number of Latin Americans, and was eliminated because of its relatively uniqueness in comparison to the other nine schools. Of these nine schools, one had black pupils coming primarily from middle class and white collar families. Four schools received students mainly from the immediately surrounding neighborhood while the other four received some of their black enrollment from noncontiguous neighborhoods due to bussing. As will be shown in the description of the site, three schools receiving their students from the immediately surrounding neighborhood met the first three criteria relatively well.

Appointments were made with each principal to discuss the study and obtain permission to work in the school. After the principal's permission was obtained, teachers responsible for classrooms with all fifth grade pupils or mixed fourth, fifth, and sixth classrooms were approached and asked to participate in the study. Of the initial three contacts, two teachers refused to participate in one school and three consented to participate in the remaining two. Therefore, contact was made with the fourth school where two teachers subsequently consented to participate.

Recent legal events require parental permission for
students to fill out personality measures. Therefore, letters were sent to parents via the children requesting that they permit their child to complete the self-esteem measure. Parents who failed to respond to the first request were sent a second letter. Those who did not respond to the second letter were subsequently phoned. This process resulted in a total sample of 110 children who were permitted to complete the self-concept/self-esteem measure out of a possible 129. Of these 110 subjects, 12 were eliminated from the analysis due to incomplete information on at least one of the variables.

Description of Site

The schools are located in what might be referred to as a transitional zone in the sense that there has been and continues to be some geographical mobility of blacks into the area. The Census Tracts where the schools are located will briefly described in terms of 1970 Census information. The schools will be referred to as I, II, and III, for the purposes of anonymity.

School I is located closest to the central part of the city. The median years of school completed by those 25 years of age and over was 12.2. The median income was $7291 and for black families it was $6130. The population was 13 percent black. Approximately 6.7 percent of the males over the age of 16 were unemployed.

School II is more distant from the central part of the city. The median years of school completed was 13. The median
income was $11,431 and median black family income was $8,675. The census tract had a population which was 24.7 percent black. The unemployment rate was 4.5 percent. The homes in this area are newer, more expensive, and better maintained.

School III is most distant from the center of the city. The median years of school completed was 12.2. The median income was $8,978 for the entire census tract. Median black family income cannot be determined since this information is not reported when there are fewer than 400 blacks in a census tract. Three percent of the males over the age of 16 were unemployed.

School I has an enrollment of approximately 211 pupils. Thirty nine percent of its enrollment is black. The average classroom size is 21.1 students. School II has an enrollment of approximately 270 pupils with an average classroom size of 22.5. The school population is 50 percent black. School III has approximately 314 students and an average of 28 pupils per classroom. Blacks make up 40 percent of the student population. The average classroom size for the entire elementary public school system is 25.6 and the average percentage of blacks per school is 27.8.

The characteristics of the students in each classroom are summarized in Table I. The classrooms were named according to whether they were assigned to control, candy reinforcement, or verbal approval conditions.

The Grand Rapids Public School System has implemented educational performance contracting in several of its schools.
### Table I

Summary of Classroom and Student Characteristics

<table>
<thead>
<tr>
<th>School/Classroom</th>
<th>Grade Level</th>
<th>Sex</th>
<th>Race</th>
<th>Mean SES</th>
<th>No. of Students</th>
<th>No. included in the Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Control</td>
<td>5</td>
<td>9M</td>
<td>16F</td>
<td>17W</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>5-6</td>
<td>12M</td>
<td>8F</td>
<td>7W</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>II Candy (1)</td>
<td>5</td>
<td>8M</td>
<td>16F</td>
<td>17W</td>
<td>26</td>
<td>17</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>5-6</td>
<td>13M</td>
<td>13F</td>
<td>22W</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>III Praise (2)</td>
<td>3-6</td>
<td>17M</td>
<td>15F</td>
<td>17W</td>
<td>32</td>
<td>25</td>
</tr>
</tbody>
</table>

One version is the Learning Unlimited program developed by Westinghouse Learning Corporation. The program is described by Bosco, Harring, and Bandy (1973):

> This program . . . is a highly structured, linear programmed format with instructional programs in reading and mathematics. It utilizes a computer-assisted management system for purposes of diagnosing, prescribing and storing information. Each day the teacher may receive a printout sheet which provides a detailed set of activities for each child. The program relies on behavior modification reinforcement techniques including a token system which rewards a student with time in a "free activity" room where a variety of games are available to those who earn the privilege of using them. In addition, the program provides for the development of a learning center. This is the place where the student goes for special instruction in reading and/or mathematics.

This particular program is in operation in schools I and II. School III utilizes a programmed reading series but does not
use a delivery system as is the case with Learning Unlimited. Math at School III is conducted in a relatively traditional manner within the classroom and without a delivery system.

All three schools use Harper & Row's *The Reading Road to Spelling*. This series is graduated in difficulty beginning with book A through F. Completion of spelling exercises requires student-teacher interaction and cannot be done alone by the students. Candy (2) and Praise (2) used book D during the study, Control and Candy (1) used book E, and Praise (1) used book F.

Control and Praise (2) were taught by black female teachers, Candy (1) and (2) by white female teachers, and Praise (1) by a white male. Candy (2) was the most disorderly with a relatively large number of behavior problem children. The remaining four classrooms were relatively well organized and disciplined in comparison. The teachers in Control, Candy (1), and (2) interacted relatively little with the pupils during spelling classes. Instructions and dictation were given in a monologue fashion. The conduct of spelling classes in Praise (1) and (2) could be more accurately classified as a dialogue, especially Praise (1). The teacher in Candy (1) spent an inordinate amount of time in keeping the children quiet and making sure that hands were raised when they wished to speak.

The children in Praise (1) seemed to know the limits and a simple reminder that these were being exceeded was usually enough to reestablish order. The teacher in Candy (2) spent quite a large portion of her time trying to keep the class organized and oriented towards spelling but often chaos would erupt followed by shouting.
in an attempt to reestablish order. The Control teacher, while conducting the spelling session in terms of a monologue much of the time, individually checked each child's work whenever possible and dispensed abundant amounts of verbal praise for work well done. She individually drilled each child on words that had been missed in previous spelling exercises and praised them for correcting their mistakes. This process was absent in the other classrooms.

In Candy (2) the students sat in four rows facing the front of the room. In the control group seating was varied from rows facing the front of the room to groups of 4-6 seated together facing one another. In the remaining classrooms the pupils sat in groups rather than in rows. Seating was varied during the year depending on how well the children could get along while sitting together.

Design

A "multiple time-series design" with a "non-equivalent control group" was utilized. The major variables were SES, race, sex, self-esteem, reinforcement and performance on spelling tests. Operationalization and measurement will be more fully discussed in another section, however, they need to be indicated here. The design required three phases and five groups/classrooms. Assignment of children to classrooms, teachers to classrooms, and classrooms to control or experimental groups was not done by random techniques; thus, it cannot be assumed that the five classrooms are equivalent.
The assignment process was determined by the principal's and teacher's willingness and ability to implement the required experimental manipulations. The principal in the school without Learning Unlimited gave his permission for an experimental manipulation but did not feel that a token system should be implemented. This appeared to also be the consensus of the teachers. Therefore, these two classrooms were organized as experimental groups with manipulation on the verbal praise of the teachers. In the remaining two schools the three teachers were familiar with token systems. Two of these teachers were assigned to experimental groups with manipulations on reinforcement. The remaining teacher was assigned to the control group. Thus, experimental and control groups were structured in terms of the willingness and abilities of the teachers rather than random procedures. The research design is outlined in Table II.

Data collection was started in September 1974, and continued until June of 1975. During Phase I, baseline measures were made on three variables: self-esteem, verbal approval, and spelling test performance. Data on the use of verbal praise by the teacher during spelling classes were collected in each classroom on at least three different occasions during Phase I. The mean of these sets of observations for each teacher was used to determine whether or not the teachers were different with respect to the use of verbal praise and as a basis for determining change in the use of verbal praise over the next two phases.

A baseline measure on verbal praise permits the deter-
Table II
Research Design

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Experimental Manipulation</th>
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<tr>
<td>Phase I</td>
<td>Phase II</td>
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<td>1. Direct observation of verbal approval.</td>
<td>1. Direct observation of verbal approval.</td>
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<td>2. Collect spelling test scores.</td>
<td>2. Collect spelling test scores.</td>
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<tr>
<td>Control</td>
<td>Candy (1) and (2)</td>
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<tr>
<td>1. Direct observation of verbal approval.</td>
<td>1. Direct observation of verbal approval.</td>
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<td>2. Collect spelling test scores.</td>
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<td>4. Implement token system.</td>
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mination of whether the manipulation of verbal praise was successful in Praise (1) and (2). It provides a basis for insuring that the amount of verbal praise has not changed in the control and

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experimental groups, Candy (1) and (2). During the baseline period it was determined that none of the teachers used any tangible reinforcers in spelling activities. Spelling test results were collected from the teachers' records or children's spelling books. Self-esteem was measured at the end of Phase I.

Two possible ways for determining the length of each phase are time and number of spelling tests completed. It became apparent very early that each teacher was moving through the spelling units at different rates. Therefore, it was decided that the completion of four spelling tests would mark the end of a phase. Phase I ended after 4 spelling units, Phase II after 8, and Phase III after 12. The self-esteem measure was given immediately after spelling tests 4, 8, and 12. This timing of self-esteem testing was required by the theoretical model being tested.

After the completion of Phase I, three types of data were available: mean spelling test scores for each student over 4 tests, self-esteem scores for each student, and a mean rate of teacher verbal approval for each classroom.

At the beginning of Phase II manipulations were implemented in the experimental groups. Token systems with back-up reinforcers were implemented in Candy (1) and (2). The children were told they would receive one point in tokens for each spelling word they correctly spelled on their unit spelling test. Tokens were made from red and green poster board into denominations of 24, 20, 10, 5, and 1. The 24 point tokens were the size of a silver dollar and of a different color from the remaining four.
sizes. The 20 point token was also the size of a silver dollar but
of the same color as the 10, 5, and 1 point tokens. The 10, 5, and
1 point tokens were made the size of a half dollar, quarter, and
nickel respectively. Each child was given a 3 x 5 brown envelope
with his/her name on it in which to keep the tokens.

The back-up reinforcers were different sizes and varieties
of candy. There were three different sizes. For a 24 point token
the child could get a 15¢ candy bar. Ten points in tokens would
purchase a smaller candy bar which cost about 6¢ and for 5 points
they could get an even smaller candy bar worth about 2¢. After
the spelling tests were given and corrected tokens were awarded.
The tokens were later exchanged for candy.

In one class the teacher normally distributed the candy
on Friday afternoons. In the other, candy was usually distributed
on the same day or as soon as possible after tokens had been awarded.
The researcher made up bags of candy with the three types in sepa­
rate plastic bags with cards indicating how much each type was
worth. The stock of candy was replenished prior to each distribution.

In Praise (1) and (2) the experimental manipulation in­
volved verbal praise or approval. The teachers were asked to in­
crease their frequency of responding with words of approval to
those children who made correct responses to questions or volun­
teered correct information during spelling. The procedure was
briefly discussed and the following suggestions were typed and
given to each teacher.

1. Show greater confidence in the child's ability
to do better in all their tasks.
2. Recognize and communicate in words and action that whatever weaknesses are present, these weaknesses are not fixed but can be improved.
3. Reward their achievements with praise and endorsement so they can have a greater sense of success and ability.
4. Show by words and action that you think education is both important and desirable.
5. Recognize your own importance and responsibility in the views your children have of themselves.
6. Show that you trust them (Brookover, et. al., 1965:312-313).

Teachers were also give a list of possible praising words and phrases.

Several differences existed between the experimental groups. First, in Candy (1) and (2) the performance of the child on a spelling test was the only thing reinforced. Teachers were not instructed to increase their verbal approval or make any other changes. In Praise (1) and (2) teachers were instructed to increase their verbal approval during all of the spelling sessions. Second, in Candy (1) and (2) reinforcement was directed at performance while in Praise (1) and (2) some of the verbal praise was directed more generally towards the student rather than specifically at his/her performance. Examples of verbal approval directed more towards the student include: "you did very well Johnny" or "you did very well but I know that you could do much better next time if you would try a little harder." "Good job" and "that's right" specifically emphasizes the child's performance rather than the child.

As in Phase I, the rate of verbal approval was determined by direct observation, spelling test scores were collected and the self-esteem measure was given between the eighth and ninth spelling
test. Phase III replicated Phase II for all groups except Candy (2). The last measure of self-esteem was obtained between tests 12 and 13. In Phase III after test 9, a bonus of 5 points in tokens was made available to all those children in Candy (2) who obtained perfect test scores and a criterion level of 15 words correct was established for reinforcement. This change was made in response to a decline in performance after an initial increase from the baseline rate. The rationale was that an increase would provide additional incentive for children to obtain perfect scores and for those scoring below 15 to at least come up to the criterion level.

The control group experienced no manipulations. Direct observations of verbal approval were made during each phase. Measures of self-esteem were taken at the end of each phase and spelling test scores were recorded for each student.

Minimal information was given to the children and teachers above that required for participation in the study. The experimenter was introduced as a graduate student who would be observing in the classroom and doing some testing as part of his doctoral studies. The token system and teacher's role in implementing it were explained to classrooms Candy (1) and (2). Praise (1) and (2) were not told about the experimental manipulation.

When the self-esteem measure was given, the instructions were read by the experimenter and examples were placed on the blackboard. Some of the children initially expressed concern that the
results of the self-esteem measure would be seen by the teacher or become part of their school records. The children were reassured as to the confidentiality of the results.

When asked by students what he was doing in the classroom, the experimenter would reply that he was merely observing their classroom as part of a study. This was usually sufficient, and further questions generally were not asked.

The experimenter performed in the classroom as a direct observer. The children determined that this was the case as evidenced by their willingness to misbehave while he was watching and the teacher's back was turned towards them. Some children tried to talk with or get help from the observer but this was discouraged by inattentiveness to the request or a verbal response of the form, "you will have to ask your teacher." A second observer assisted in data collection and provided a reliability check on the author. No problems were experienced while working in the classrooms or the schools. Apparently classrooms and teachers have enough autonomy that experiments in one classroom do not cause problems in other classrooms in the same school.

**Major Variables**

**Self-esteem**

Conceptually self-esteem is the result of self-evaluation whereby an individual examines his performances, capacities, and attributes, and arrives at a decision regarding his personal worthiness. Theoretical and practical concerns caused several
restrictions to be placed on the selection of an instrument to measure self-esteem. First, it was required that the instrument measure academic and general self-esteem. Second, the instrument had to be cognitively and symbolically appropriate for elementary students. Third, it had to be short enough such that students would not refuse to complete it on successive testing. A relatively short instrument was also desired because of the assumption that an elementary school student's attention span with respect to completing a self-esteem measure would not be longer than fifteen to twenty minutes. Finally, a short instrument was desired to prevent parents from becoming concerned that their children were spending too much time filling out self-esteem measures rather than learning. Fourth, an instrument was needed to detect change in self-esteem over relatively short periods of time.

For this study, self-esteem is a "personal judgement of worthiness" with respect to several different postulated dimensions. Self-esteem is operationally defined as that which is measured by a 29-item instrument (see Appendix D) made up of items from three different instruments considered to be suitable for upper elementary children.

Twenty items are from the Coopersmith Self-Esteem Inventory (SEI) (Coopersmith, 1967). Coopersmith contends that the SEI focuses upon only one dimension of the self--the evaluative dimension or self-esteem. He postulates the existence of five sub-scales in the SEI: General Self, Social Self-Peers, Home-Parents,
Lie Scale, and School Academic. His subjects did not express significantly different self-attitudes for these subscales, excluding the Lie Scale. Therefore, the assumption that the instrument is indeed unidimensional and that one subscale is probably as good as another as an indicator of self-esteem is supported by his data.

In selecting items from the SEI, the primary concern was in obtaining items that dealt with general self-esteem. Eleven items were chosen to accomplish this particular goal from the General Self subscale of the SEI. Four items from the School Academic, three from the Social Self-Peers, and two from the Lie Scale subscale were included. The school academic items are included because of the central concern for the student's self-esteem in relation to academic events. The social self-peer items give more depth to the scale and the lie items provide a check on the honesty of the respondents.

While the twenty items selected from the SEI are more general in nature, the remaining nine items are much more specifically related to academic events. Three items are from the Michigan State General Self-Concept of Ability Scale (Brookover, et. al., 1965). Brookover and his associates (1965:51) conceptualize general self-concept of ability as "the evaluation one makes of oneself in respect to the ability to achieve in academic tasks in general as compared to others." Six items were taken from the Michigan State University Self-Concept of Ability in Specific Subjects Scales (Brookover, et. al., 1965).
Brookover and his associates (1965:53) conceptualize specific self-concept of ability as "the evaluation one makes of himself in respect to a given subject matter area." Three of these items are concerned with specific self-concept of ability in spelling and three with mathematics. These items were included to obtain specific information on self-esteem as it relates to spelling (the major dependent variable) and to obtain comparative information as to how self-esteem in one academic area is related to self-esteem in other subject areas.

The instrument, so far, meets the theoretical and practical concerns discussed initially. The final concern, was that the instrument be able to detect small scale changes in self-esteem. The SEI provides for two response categories: like me and unlike me. The Michigan State Scales provide for five response categories. The problem with either two or five response categories is how much change does a subject have to experience in self-esteem before he/she will change categories? More specifically, how much change in self-esteem does a subject have to experience before he/she will change an unlike me to a like me response? It is suggested that a person may actually experience a change in self-esteem but may not experience enough change to cause a shift to a different category. Considering this problem, it was decided to provide subjects with the opportunity to respond in terms of a continuum defined by appropriate labels. For the 20 SEI items the end points were defined as "very much like me" and "very much not like me." For the Michigan State items, six were defined by "among the
poorest" and "among the best" and three were defined by "much below average" and "excellent." The subject could place an "X" any place on the continuum to indicate his/her self-esteem with respect to the item. This permitted the respondent to indicate any degree of quantitative change in self-esteem and did not require a certain quantitative threshold to be reached before the change could be expressed as is the case with response categories.

Since the instrument has not previously been used reliability, validity, and factor structure will be examined in terms of the present data. Some indication as to the reliability, validity, and factor structure of the present instrument may be gained by briefly examining the instruments from which the 29 items were derived.

Coopersmith (1967) reports a test-retest reliability of .70 after a three-year interval for a sample of 56 children. He does not provide enough information to allow any conclusions concerning validity. Wylie (1974:173) concludes "that Coopersmith's research cannot appropriately be used to support the construct validity of the SEI as a measure of self-regard because the research is uninterpretable." She refers to other studies which support relatively low convergent validity for the instrument. Coopersmith (1967) does not report information on factor structure, however, White and Richmond (1970) and Throckmorton (1975) have factor analyzed the SEI. The results do not support Coopersmith's contention of unidimensionality of the SEI nor do they support the idea of five postulated subscales. Wylie (1974) concludes,
after examining Cooperamith (1967) and subsequent research utilizing the SEI: "altogether, the state of development of this inventory and the amount of available information about it do not make it an instrument of choice for self-concept on child S" (Wylie, 1974:174).

Brookover, et. al., (1965) reports coefficients of reproducibility of .95 for males and .96 for females for a sample of seventh grade students on the Michigan State General Self-Concept of Ability Scale. Hoyt's Analysis of Variance resulted in reliabilities in the range of .77 to .92 for seventh through tenth grade samples. The test-retest reliability coefficients after an interval of one year were .75 and .77 respectively for males and females. Hoyt's Analysis of Variance resulted in reliabilities in the range of .89 to .94 for the Self-Concept of Ability in Specific Subjects Scales. Test-retest correlations ranged from .63 to .80. As an indication of validity, relatively high correlations (.54 and greater) were found to exist between general self-concept and each specific subject self-concept. Correlations of .50 and larger were found to exist between self-concept of ability and the perceived evaluations of academic ability held by others. Predictive validity was found to be good in that general self-concept of ability was highly correlated with grade point average. The factor structure of the scales is not reported.

Odd-even estimates of reliability for the present instrument were determined by the Spearman-Brown formula. An analysis of the data from the baseline phase showed the reliability of the instrument to be .86. The estimated reliability increased to .91
in Phase II. As a further check on reliability a test-retest reliability coefficient was determined to be .69. This is comparable to that reported by Coopersmith (1967) for the SEI. It is also within the range of test-retest reliabilities reported for the Michigan State Scales. Compared to the SEI and the Michigan State Scales, the present instrument appears similar in reliability.

Factor analysis was used to examine the dimensionality of the instrument. The data were analyzed utilizing a principal components solution, with unities in the diagonal. The results are based on the first administration of the instrument. An analysis of the interitem correlation matrix resulted in ten eigenvalues greater than one accounting for 71 percent of the total variance. Factor I accounted for 25 percent of the variance. Factor loadings, presented in Table III, on Factor I ranged from .00 to .78, with thirteen items having loadings greater than .50.

Wylie (1974:98) suggests that if the only purpose of an instrument is to measure a global construct, self-esteem, "one should be able to attain a meaningful general-factor solution from an interitem correlation matrix involving semantically heterogeneous content; and the items should load acceptably on the general factor."

Assuming .50 to be an acceptable loading, then, it must be concluded that a meaningful general-factor solution has not been obtained; and, the instrument is not unidimensional. Factor I can be characterized in terms of self-concept of ability (general
Table III
Unrotated Factor Matrix for 29 Items

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<td>21</td>
<td>02</td>
<td>-12</td>
<td>56</td>
<td>-07</td>
<td>-36</td>
<td>-22</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

*Decimal points are not printed.

and specific). The nine Michigan State items have the highest factor loadings. Only four of the SEI items load higher than .50 on Factor I. This analysis does not support the notion of independent subscales since the items which are posited as forming subscales do not load high on factors which can be identified

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as the subscales in question. The possibility of separate subscale scores based upon the selection of items from three different instruments (a total of seven possible subscales) is not supported by a factor analysis of the data.

These negative results raise the question, why is the instrument multidimensional? A search for the answer was conducted as follows. First, scores on each of the seven postulated subscales were determined and the intersubscale correlation matrix factor analyzed. This analysis resulted in two eigenvalues greater than one accounting for 64 percent of the total variance. Factor I accounted for 50 percent of the variance. Table IV reports the factor loadings for each factor rotated.

Table IV
Rotated Factor Matrix for Seven Postulated Subscales

<table>
<thead>
<tr>
<th>Postulated Subscales</th>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Self-Concept of Ability</td>
<td>.89</td>
<td>.08</td>
</tr>
<tr>
<td>Specific Self-Concept of Ability (Spelling)</td>
<td>.81</td>
<td>-.11</td>
</tr>
<tr>
<td>Specific Self-Concept of Ability (Math)</td>
<td>.82</td>
<td>-.01</td>
</tr>
<tr>
<td>General Self</td>
<td>.70</td>
<td>.28</td>
</tr>
<tr>
<td>Social Self-Peers</td>
<td>.62</td>
<td>.29</td>
</tr>
<tr>
<td>Lie Scale</td>
<td>.05</td>
<td>.95</td>
</tr>
<tr>
<td>School Academic</td>
<td>.62</td>
<td>.11</td>
</tr>
</tbody>
</table>

Except for the Lie Scale, the instrument appears to closely approximate unidimensionality. If the Lie Scale was
eliminated the present instrument would be relatively unidimensional. How can the instrument approximate unidimensionality with respect to a factor analysis of the subscales but not the items? The second stage of the analysis consisted of factor analyzing each of the seven postulated subscales to determine their dimensionality. The results are presented in Tables V through XI.

Table V

Factor Matrix for General Self-Concept of Ability

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How do you rate yourself in school ability compared with your close friends?</td>
<td>.79</td>
</tr>
<tr>
<td>7. How do you rate yourself in school ability compared with those in your class at school?</td>
<td>.86</td>
</tr>
<tr>
<td>14. Forget for a moment how others grade your work. In your opinion how good do you think your work is?</td>
<td>.84</td>
</tr>
</tbody>
</table>

Table VI

Factor Matrix for Lie Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. I always do the right thing.</td>
<td>.74</td>
</tr>
<tr>
<td>25. I always know what to say to people.</td>
<td>.74</td>
</tr>
</tbody>
</table>
Table VII
Factor Matrix for Specific Self-Concept of Ability (Spelling)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. How do you rate your ability in spelling compared with those in your class?</td>
<td>.84</td>
</tr>
<tr>
<td>16. How do you rate your ability in spelling compared with your close friends?</td>
<td>.89</td>
</tr>
<tr>
<td>20. Forget for a moment how others grade your work. In your opinion how good do you think your work in spelling is?</td>
<td>.86</td>
</tr>
</tbody>
</table>

Table VIII
Factor Matrix for Specific Self-Concept of Ability (Mathematics)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Forget for a moment how others grade your work. In your opinion how good do you think your work in mathematics is?</td>
<td>.81</td>
</tr>
<tr>
<td>10. How do you rate your ability in mathematics compared with those in your class?</td>
<td>.86</td>
</tr>
<tr>
<td>24. How do you rate your ability in mathematics compared with your close friends?</td>
<td>.86</td>
</tr>
</tbody>
</table>

Four of the seven subscales are relatively unidimensional: General Self-Concept of Ability, Specific Self-Concept of Ability (Spelling and Math), and the Lie Scale. The first factor on each of these subscales accounts for 54 to 74 percent of the variance. The remaining three subscales cannot be considered as unidimensional.
Table IX
Rotated Factor Matrix for School Academic

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>6. My teacher makes me feel I'm not good enough.</td>
<td>.11</td>
</tr>
<tr>
<td>8. I'm proud of my school work.</td>
<td>.80</td>
</tr>
<tr>
<td>17. I like to be called on in class.</td>
<td>.83</td>
</tr>
<tr>
<td>27. I often get discouraged in school.</td>
<td>-.05</td>
</tr>
</tbody>
</table>

Table X
Rotated Factor Matrix for Social Self-Peers

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>4. I'm a lot of fun to be with.</td>
<td>.81</td>
</tr>
<tr>
<td>15. I would rather play with children younger than me.</td>
<td>.01</td>
</tr>
<tr>
<td>25. Most people are better liked than I am.</td>
<td>.68</td>
</tr>
</tbody>
</table>

Two items in the School Academic subscale are sufficiently different to require the addition of a second factor. Together these two factors account for 64 percent of the variance, while Factor I only accounts for 35 percent. Two factors account for 72 percent of the variance in the Social Self-Peers subscale. The General Self subscale is dimensionally the most complex with three factors.
Table XI
Rotated Factor Matrix for General Self

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
<th>Factor II</th>
<th>Factor III</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. I don't care what happens to me.</td>
<td>.60</td>
<td>-.12</td>
<td>.45</td>
</tr>
<tr>
<td>11. I can usually take care of myself.</td>
<td>.09</td>
<td>.82</td>
<td>-.14</td>
</tr>
<tr>
<td>12. I'm a failure.</td>
<td>.83</td>
<td>.08</td>
<td>-.13</td>
</tr>
<tr>
<td>13. I'm pretty happy.</td>
<td>.34</td>
<td>.38</td>
<td>.31</td>
</tr>
<tr>
<td>18. Things are all mixed up in my life.</td>
<td>.75</td>
<td>.03</td>
<td>.15</td>
</tr>
<tr>
<td>19. I can make up my mind and stick to it.</td>
<td>.03</td>
<td>.46</td>
<td>.37</td>
</tr>
<tr>
<td>21. I have a low opinion of myself.</td>
<td>.58</td>
<td>.20</td>
<td>.23</td>
</tr>
<tr>
<td>22. I often feel ashamed of myself.</td>
<td>.68</td>
<td>-.04</td>
<td>-.02</td>
</tr>
<tr>
<td>23. If I have something to say I usually say it.</td>
<td>-.03</td>
<td>-.06</td>
<td>.78</td>
</tr>
<tr>
<td>28. Things usually don't bother me.</td>
<td>-.07</td>
<td>.60</td>
<td>.28</td>
</tr>
<tr>
<td>29. I can't be depended upon.</td>
<td>.11</td>
<td>.20</td>
<td>.56</td>
</tr>
</tbody>
</table>

having eigenvalues greater than one and accounting for only 51 percent of the variance.

It is concluded that the present instrument is in fact multidimensional. The closest approximation to a unidimensional scale is obtained when the intersubscale correlations are analyzed. Four of the seven subscales are relatively unidimensional and three are multidimensional. Thus, two considerations prevent the realization of a unidimensional instrument in terms of interitem correlations. First, the Lie Scale constitutes a
separate dimension in terms of intersubscale analysis. Second, if one could assume that each of the first factors was identical with a more general dimension, there would still be possibly four other dimensions defined by the four extra factors in the three multidimensional subscales. Analysis indicates that the first factor in each subscale is not identical with a general dimension. The first factor in each of the Michigan State subscales is identical with a general dimension. However, the addition of any other first factor generates another dimension. Factor analysis of the items which define the first factor on each subscale resulted in a five factor solution.

Based upon the above results it was decided to use factor analytic techniques to inductively develop a more structurally simple instrument. Obviously the assumption that the Michigan State items and the Coopersmith items are conceptually similar is false. The nine Michigan State items approximate an unidimensional scale. Factor analysis of these items resulted in a single factor accounting for 56 percent of the variance. Factor loadings ranged from .65 to .79. Therefore, the Michigan State items are considered to be on a single dimension different from those dimensions found in the twenty SEI items. The Michigan State items were combined into a subscale and defined as self-concept of ability.

Eighteen of the SEI items were factor analyzed in an attempt to develop a relatively unidimensional general self-esteem subscale. The lie items were excluded. This analysis resulted in
six items with one factor accounting for 48 percent of the variance. Factor loadings ranged between .638 and .758. This relatively unidimensional six item subscale was defined as general self-esteem. The items from each subscale were combined and factor analyzed. Two factors accounted for 42 and 12 percent of the variance respectively. The first dimension is defined by the self-concept of ability items and the second by the self-esteem items. Items and factor loadings are presented in Table XII.

An estimation of the empirical or statistical validity (Thorndike and Hagen, 1969:166) of these subscales was obtained by intercorrelating them with the Behavior Rating Form (see Appendix C) developed by Coopersmith (1967). This instrument measures the teacher's perceptions of the behavioral manifestations of the student's self-esteem. The Behavior Rating Form was given at the end of the school year. Table XIII presents the results of this analysis.

Each of the correlation coefficients is statistically significant. Thus, the student's reported self-concept of ability and self-esteem is significantly related to the teacher's perceptions of the student's behavior. The subscales are considered to be statistically valid, even though higher intercorrelations are desirable.

Spelling

Achievement has been operationalized in a number of different ways including grade point average and scores on standardized
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor I</th>
<th>Factor II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How do you rate yourself in school ability compared with your close friends?</td>
<td>.76</td>
<td>.08</td>
</tr>
<tr>
<td>7. How do you rate yourself in school ability compared with those in your class at school?</td>
<td>.71</td>
<td>.29</td>
</tr>
<tr>
<td>14. Forget for a moment how others grade your work. In your opinion how good do you think your work is?</td>
<td>.70</td>
<td>.35</td>
</tr>
<tr>
<td>2. How do you rate your ability in spelling compared with those in your class?</td>
<td>.61</td>
<td>.25</td>
</tr>
<tr>
<td>16. How do you rate your ability in spelling compared with your close friends?</td>
<td>.76</td>
<td>.13</td>
</tr>
<tr>
<td>20. Forget for a moment how others grade your work. In your opinion how good do you think your work in spelling is?</td>
<td>.75</td>
<td>.23</td>
</tr>
<tr>
<td>3. Forget for a moment how others grade your work. In your opinion how good do you think your work in mathematics is?</td>
<td>.75</td>
<td>.25</td>
</tr>
<tr>
<td>10. How do you rate your ability in mathematics compared with those in your class?</td>
<td>.69</td>
<td>.15</td>
</tr>
<tr>
<td>24. How do you rate your ability in mathematics compared with your close friends?</td>
<td>.75</td>
<td>.10</td>
</tr>
<tr>
<td>9. I don't care what happens to me.</td>
<td>.07</td>
<td>.71</td>
</tr>
<tr>
<td>12. I'm a failure</td>
<td>.34</td>
<td>.68</td>
</tr>
<tr>
<td>18. Things are all mixed up in my life.</td>
<td>.01</td>
<td>.77</td>
</tr>
<tr>
<td>21. I have a low opinion of myself.</td>
<td>.30</td>
<td>.60</td>
</tr>
<tr>
<td>22. I often feel ashamed of myself.</td>
<td>.32</td>
<td>.52</td>
</tr>
<tr>
<td>15. I would rather play with children younger than me.</td>
<td>.18</td>
<td>.67</td>
</tr>
</tbody>
</table>

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Self-Esteem, Self-Concept of Ability, and Behavior Rating Form Correlations

<table>
<thead>
<tr>
<th></th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td>.35*</td>
<td>.33*</td>
<td>.42*</td>
</tr>
<tr>
<td>Self-Concept of Ability</td>
<td>.25*</td>
<td>.30*</td>
<td>.30*</td>
</tr>
</tbody>
</table>

*p < .02

achievement tests. For the purposes of this study it was desired that some indicator of achievement be selected that could be measured at several points in time over the academic year and which would be maximally responsive to changes in reinforcement within the classroom situation. Therefore, achievement was operationalized as the score obtained on unit spelling tests taken as part of the required activities in carrying out the spelling program structured by the book: The Reading Road to Spelling. Spelling test scores were collected and means determined for the tests in each phase of the design. The test-retest reliability of the spelling test scores based upon Phase I and II was determined to be .80.

Race and Sex

Due to legal problems involved in asking questions which require a person to identify himself by race it was decided that subjects would be racially classified by the experimenter. Based

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upon the perceptions of the experimenter, children were either classified as white or black. Two children were observed to be Latin Americans on the basis of physical characteristics and surname. Rather than form a third category they were classified as white. Children were classified as male or female on the basis of perceived physical characteristics and first name. While determining the child's race and sex in this way may introduce some error, especially in terms of sexual and racial identity, the error is believed to be minimal. It is believed that the experimenter's categorization of the subject would correspond to that of the child's teacher and that it is this "definition of the situation" that is relevant for the study.

**Socio Economic Status**

SES was measured in terms of the father's, guardian's, or mother's occupation. The children were asked to complete a questionnaire (see Appendix B) which requested information on occupation. The occupations were coded using the Census Bureau's "Scores for Categories of Occupation Component." Father's or male guardian's occupation was used to determine SES if the child lived in a family with a male head. Mother's or female guardian's occupation was utilized if no male was present.

**Reinforcement**

Theoretically, a reinforcer is that which results in an increase in the rate of performance of an operant; or, an increase
in the quality of performance for the purposes of this study. Therefore, it cannot be determined if a particular stimulus is a reinforcer until after it has followed the operant for a period of time. Based upon the literature, it was determined that a token system with candy as a back-up and verbal approval would function as reinforcers. The determination of whether or not reinforcement was correctly operationalized will be dealt with in subsequent chapters.

Verbal approval is operationalized as positive words or phrases which the teacher responds with subsequent to a child's performance related to spelling. Words and phrases considered to be of an approving nature were provided, although teachers did not limit themselves to this list. Data on verbal approval were collected by the experimenter and an assistant during the spelling session over the period of a year.

Seating charts were made for each classroom. If the teacher immediately responded to a spelling related behavior emitted by the child with a word or phrase perceived by the observer as verbal approval, the word or phrase was recorded under the child's name on the seating chart. These words and phrases were later totalled and divided by the number of minutes in the class period to obtain the rate of teacher verbal approval expressed as number of responses per minute.

Interrater reliability was checked on two different occasions and was found to be .72 and .62. While a much higher interrater reliability (at least .90) is desirable, it is believed
that the obtained coefficients are relatively good given that a
structured instrument was not utilized. The rater was instructed
to record any word or phrase indicating approval. Relatively low
reliability is due to different interpretations of what constitutes
verbal approval. For example, "okay" was considered to be verbal
approval in most instances by the experimenter. However, sometimes
it appeared that "okay" simply meant "let's proceed" or "we're
finished with that." Interrater reliability is also a function
of the location of the observer in the classroom. On both
occasions the experimenter and assistant were on opposite sides
of the classroom and some verbal behavior was differentially avail­
able to the observers, especially that performed on a one-to-one
basis with the student. The teacher was not followed around the
classroom since this tends to be disruptive.

The experimenter tended to be more liberal in his recording
of verbal approving behavior than the assistant. This is indicated
by the fact that the experimenter recorded a higher mean number
of responses on each occasion than did the assistant. The experi­
menter recorded a mean of .97 and 1.69 responses when reliability
checks were made. The assistant recorded a mean of .61 and 1.3
for these respective times.

That a manipulation on verbal approval was successfully
implemented and significant increases in verbal approval did not
occur in the control group or Candy (1) and (2) is indicated in
Table XIV. While differences in the rate of verbal approval were
observed, a one-way analysis of variance of the mean rates of verbal
approval suggests that the samples were not drawn from different populations.

Table XIV

Mean Rate of Verbal Approval by Classroom and Phase

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.03</td>
<td>.37</td>
<td>.24</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>.28</td>
<td>.39</td>
<td>.25</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>.55</td>
<td>.15</td>
<td>.07</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>.86</td>
<td>1.22</td>
<td>1.39</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>.55</td>
<td>1.15</td>
<td>.91</td>
</tr>
</tbody>
</table>

Praise (1) and (2) experienced a relatively large increase in the rate of verbal approval in Phase II. Control, Candy (1) and (2) did not experience a comparable increase indicating that the manipulation on verbal approval was successful. The apparent decline in verbal approval in the control group was due to a schedule change in the middle of the year. This teacher often individually graded her children's spelling lessons after the spelling session ended. These individual grading sessions were observed and recorded in the early part of the year. Due to a restructuring of the classroom schedule and scheduling problems on the part of the experimenter, the individual grading sessions were not observed after the change. Therefore, the decline in the rate of verbal approval in the control group does not indicate an actual decline but a change in data.
collection procedures due to the exigencies of the situation. Changes in data collection procedures do not account for the apparent changes in the other classrooms.

An one-way analysis of variance of verbal approval by classroom in Phase II resulted in a $F = 7.673$ ($p = .0029$). Thus, the classrooms appear to constitute samples of diverse populations. The five classrooms are more different in Phase II with respect to verbal approval than they were in Phase I. A $t$ test of the difference in verbal approval between Phase I and Phase II for Praise (1) and (2) resulted in $t = 2.153$ ($p = .043$). A $t$ value of $-2.426$ was obtained when differences in verbal approval for Control, Candy (1) and (2) were compared. These results suggest that changes did occur in verbal approval from Phase I to Phase II. The change observed with respect to Control, Candy (1) and (2) is considered to be largely due to the change in procedures discussed earlier. However, it is concluded that the significant change in the rate of verbal approval in Praise (1) and Praise (2) is the result of experimental manipulation. Of the two groups, in which verbal approval was manipulated, Praise (2) experienced the greatest amount of change.

Description of Sample

The primary purpose of this section is to determine whether the five classrooms in this study are from the same population given that classrooms and subjects were not randomly selected or assigned to control or experimental groups. Analysis
of variance techniques were utilized to shed some light on this issue. It is acknowledged that the assumption of selection is violated and that tests of significance are relatively meaningless in the interpretation of the resulting F ratios. Therefore, the probabilities of getting a specified F ratio will only be considered in a suggestive fashion or a descriptive manner. If the probability of getting the obtained F ratio is less than .05 then the null hypothesis that the population means are equal will be considered to be rejected. Throughout this study the level of significance will be considered to be .05.

Mean spelling test, self-esteem, and self-concept of ability scores are reported in Table XV for Phase I.

Table XV

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Self-Esteem</th>
<th>Self-Concept of Ability</th>
<th>Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>213.4</td>
<td>284.1</td>
<td>23.18</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>231.9</td>
<td>307.4</td>
<td>22.65</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>179.7</td>
<td>235.0</td>
<td>19.45</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>238.8</td>
<td>348.0</td>
<td>21.70</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>206.2</td>
<td>287.0</td>
<td>20.69</td>
</tr>
</tbody>
</table>

An one-way analysis of variance of self-esteem scores during Phase I by classroom resulted in a $F = 2.536$ ($p = .0452$).

Analysis of self-concept of ability scores by classroom resulted
in a $F = 4.774 \ (p = .0015)$. Analysis of mean spelling test scores for Phase I by classroom resulted in a $F = 9.492 \ (p = .0000)$. These findings suggest that the null hypothesis of equal population means should be rejected. It is not safe to assume that the five classrooms come from the same population. This conclusion has an implication for the proposed model. It requires that classroom be considered as an independent variable, otherwise, error terms will be larger than need be, given the information made available by this analysis.
CHAPTER III

RESULTS

Parametric statistical procedures were utilized to analyze the data. The nominal variables sex, race, reinforcement, and classroom were assigned scores of 1 or 0 respectively for the presence or absence of the attribute. While certain assumptions have been violated, parametric statistics permits the use of more of the available information than nonparametric procedures. The violation of these assumptions prohibits the use of tests of significance as decisional criterion. Therefore, they will only be considered as suggestive as to whether a particular statistical value is sufficiently large to cause a hypothesis to be supported. The reader is cautioned against making inferences about any larger population based upon the statistics reported herein.

For the readers convenience, each hypothesis will be restated prior to reporting the relevant data, and whether the hypotheses should be accepted or rejected will be indicated. Interpretation of the results will be reserved for Chapter IV.

Hypothesis One: The self-esteem of black elementary school students is greater than that of whites.

Hypothesis Two: The self-concept of black elementary school students is greater than that of whites.

Inspection of the data in Table XVI shows whites to have somewhat higher scores on self-esteem and self-concept of ability.
Table XVI
Race, Self-Esteem, and Self-Concept of Ability

<table>
<thead>
<tr>
<th>Race</th>
<th>Self-Esteem</th>
<th></th>
<th>Self-Concept of Ability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Black</td>
<td>205.4</td>
<td>64.69</td>
<td>290.8</td>
<td>75.43</td>
</tr>
<tr>
<td>White</td>
<td>220.8</td>
<td>57.30</td>
<td>297.9</td>
<td>85.19</td>
</tr>
</tbody>
</table>

than blacks. Since the differences in mean scores of self-esteem and self-concept of ability are not in the direction hypothesized, these data suggest that hypotheses one and two should be rejected.

Hypothesis Three: There is a positive relationship between self-concept and academic achievement.

Hypothesis Four: There is a positive relationship between self-esteem and academic achievement.

Table XVII presents correlation and regression coefficients relevant to hypotheses three and four. Arrows show the postulated direction of causation for the purposes of computing regression coefficients. In this analysis, and the ones that follow, Praise (1) is eliminated where data on spelling for Phase III is required. The teacher in Praise (1) did not give any spelling tests during Phase III. In all other analyses, however, this group will be included.

The correlation coefficients reported in Table XVII are all positive and significant suggesting that self-esteem and
Correlation and Regression Coefficients for Spelling, Self-Esteem, and Self-Concept of Ability

<table>
<thead>
<tr>
<th></th>
<th>r</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Concept of Ability (Phase I) → Spelling (Phase II)</td>
<td>.73*</td>
<td>.0066*</td>
</tr>
<tr>
<td>Self-Esteem (Phase I) → Spelling (Phase II)</td>
<td>.25*</td>
<td>.0053*</td>
</tr>
<tr>
<td>Self-Concept of Ability (Phase II) → Spelling (Phase III)</td>
<td>.24*</td>
<td>.0100*</td>
</tr>
<tr>
<td>Self-Esteem (Phase II) → Spelling (Phase III)</td>
<td>.25*</td>
<td>.0162*</td>
</tr>
</tbody>
</table>

*p < .05

Achievement and self-concept of ability and achievement are indeed associated. Three of the four regression coefficients are significant. Regressing spelling (Phase II) on self-esteem (Phase I) did not result in a statistically significant regression coefficient. Thus, the data do not lead to the rejection of either hypothesis three or four.

Hypothesis Five: The implementation of a reinforcement program in the classroom setting will produce an increase in academic performance.

Inspection of the data in Table XVIII shows no statistically significant differences in mean spelling test performance between Phase I and Phase II or Phase II and Phase III. Two of the experimental groups, however, did experience an increase in
Table XVIII
Mean Differences in Spelling Test Scores between Phases

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Phase II - Phase I</th>
<th>Phase III - Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>.0435</td>
<td>-.0724</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>-.7206*</td>
<td>.8137*</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>.7435*</td>
<td>-.9679*</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>.3250</td>
<td>no data</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>.7034*</td>
<td>-.5600</td>
</tr>
</tbody>
</table>

*p < .10

Mean spelling test performance from Phase I to Phase II which approaches statistical significance. The gain in those experimental groups where an increase was observed was larger than the gain in the control group. One experimental group, however, experienced a significant decline in mean spelling test performance.

From Phase II to Phase III, two experimental groups and the control group declined in mean spelling test performance. One experimental group experienced a significant increase in mean spelling test performance. The reader is reminded that a change was made in Candy (2) during Phase III. Note that the change did not result in the maintenance of the initial gain. In fact, the loss approaches statistical significance. The overall effects were net gains for two of the experimental groups. Net losses were experienced by one experimental group and the control group.
These data do not unequivocally lead to the rejection of hypothesis five since there are three instances where changes in the experimental groups approach statistical significance.

Hypothesis Six: The implementation of a reinforcement program in the classroom setting will produce an increase in self-concept.

Table XIX

Mean Differences in Self-Concept of Ability between Phases

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Phase II - Phase I</th>
<th>Phase III - Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>12.414</td>
<td>17.955**</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>3.267</td>
<td>23.193***</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>30.191</td>
<td>-19.666</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>14.850</td>
<td>3.267</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>32.440*</td>
<td>1.1188</td>
</tr>
</tbody>
</table>

*p < .01          **p < .05          ***p < .10

The data in Table XIX shows three significant differences between self-concept of ability measured in Phase I and Phase II and Phase II and Phase III. With the exception of one experimental group, all five groups experienced an increase in self-concept of ability between each Phase. One experimental group experienced a net increase from Phase I to Phase III but a decrease from Phase II to Phase III. While the experimental groups were expected to experience the greatest change in self-concept of ability, this was only true for one experimental group which experienced a mean change of 32.44 from Phase I to Phase II. The next largest change
occurred in the control group with the remaining experimental groups all experiencing less net change than the control.

Hypothesis six may also be examined with respect to spelling since the self-concept of ability scale contains three items specifically related to spelling. Since the reinforcement program was primarily directed at spelling performance, it might be expected that a change in self-concept of ability with respect to spelling would be more likely to occur than would a change in general self-concept of ability.

Table XX

Mean Differences in Self-Concept of Ability (Spelling) between Phases

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Phase II - Phase I</th>
<th>Phase III - Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>6.435</td>
<td>1.609</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>4.059</td>
<td>4.941</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>18.576</td>
<td>-3.769</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>4.500</td>
<td>3.017</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>9.120</td>
<td>-1.520</td>
</tr>
</tbody>
</table>

Inspection of the data in Table XX shows no statistically significant differences between self-concept of ability with respect to spelling measured in Phase I and Phase II or Phase II and Phase III. All groups experienced a net increase from Phase I to Phase III. However, two of the experimental groups experienced a decrease from Phase II to Phase III. The largest net increases were experienced by two of the experimental groups with the control group third.
Since the implementation of a reinforcement program, with one exception, did not produce statistically significant effects on self-concept of ability or self-concept of ability with respect to spelling, hypothesis six is, therefore, rejected.

Hypothesis Seven: The implementation of a reinforcement program in the classroom setting will produce an increase in self-esteem.

Table XXI

Mean Differences in Self-Esteem by Phase

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Phase II - Phase I</th>
<th>Phase III - Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>11.914</td>
<td>-4.524</td>
</tr>
<tr>
<td>Candy (1)</td>
<td>-17.055*</td>
<td>13.017</td>
</tr>
<tr>
<td>Candy (2)</td>
<td>1.345</td>
<td>-16.024</td>
</tr>
<tr>
<td>Praise (1)</td>
<td>10.050</td>
<td>-9.400</td>
</tr>
<tr>
<td>Praise (2)</td>
<td>10.919</td>
<td>5.652</td>
</tr>
</tbody>
</table>

*p < .10

The data reported in Table XXI show only one mean difference to approach significance. Three groups experienced net increases in self-esteem and two experimental groups experienced net decreases. With the exception of Candy (1), all groups experienced an increase in mean self-esteem from Phase I to Phase II. The largest net increase from Phase I to Phase III was experienced by Praise (2) with the control group second. From Phase I to Phase II, the largest increase in mean self-esteem was experienced by the control group.
rather than any of the experimental groups, thus, the data are not supportive of the hypothesized relationship between reinforcement and self-esteem.

**Hypothesis Eight:** Reinforcement will have a differential effect upon achievement given different levels of self-concept.

**Hypothesis Nine:** Reinforcement will have a differential effect upon achievement given different levels of self-esteem.

Interaction effects were investigated utilizing two-way repeated measure analysis of variance techniques. For the purposes of this analysis, self-concept of ability and self-esteem were each categorized into high, medium, and low categories. Data on spelling for Phases I, II, and III were analyzed for the combined groups Candy (1), (2), and Praise (2).

The data show that self-concept of ability has a statistically significant effect on spelling performance ($F = 3.898, p = .025$). The main effect of reinforcement is statistically nonsignificant ($F = .747, p = .476$). The interaction between reinforcement and self-concept of ability is not significant ($F = .841, p = .501$).

The main effect of self-esteem is not significant ($F = 2.632, p = .079$). The reinforcement effect is not significant ($F = .767, p = .466$). Also, the interaction effect of these variables is nonsignificant ($F = 1.946, p = .106$). These findings lead to the rejection of both hypotheses eight and nine.

**Hypothesis Ten:** Reinforcement will have a differential effect upon the self-esteem of black and white elementary school pupils.
A two-way repeated analysis of variance of self-esteem scores by race for each phase resulted in no statistically significant interaction effect for race and reinforcement ($F = .333$, $p = .710$). Black self-esteem scores were lower than whites for each of the three phases. Whites experienced a slight decrease in self-esteem over the three phases while blacks experienced a slight increase. These trends, while in opposite directions, were not large enough to produce a significant interaction term. Therefore, the hypothesized differential effect of reinforcement on black and white self-esteem is rejected.

Hypothesis Eleven: Reinforcement will have a differential effect upon the self-concept of black and white elementary school pupils.

A two-way repeated analysis of variance of self-concept of ability for each phase resulted in no statistically significant interaction effect for race and reinforcement ($F = 2.238$, $p = .112$). White pupils experienced a relatively large increase in self-concept of ability from Phase I to Phase II and a smaller increase from Phase II to Phase III. Black pupils experienced a small increase from Phase I to Phase II and a slight decrease from Phase II to Phase III. The data show the existence of some interaction between reinforcement and race but it is not statistically significant. Therefore, the hypothesized differential impact of reinforcement upon the self-concept of black pupils is not supported by the data. Statistically significant interaction was also absent when self-concept of ability with respect to spelling was examined.

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Hypothesis Twelve: Reinforcement will have a differential effect upon the achievement of black and white elementary school pupils.

A two-way repeated analysis of variance of spelling test scores for each phase shows no statistically significant interaction between reinforcement and race ($F = .154$, $p = .857$). Spelling test scores for blacks were lower than those of whites for each phase but the differences were not statistically significant. The trend for both blacks and whites is curvilinear with both experiencing a slight increase from Phase I to Phase II and a slight decrease from Phase II to Phase III. Thus, the data do not support the hypothesized differential impact of reinforcement upon the spelling performance of blacks in comparison to whites.

Hypothesis Thirteen: Self-concept operates as an intervening variable between the behavior of others and the student's achievement.

Hypothesis Fourteen: Self-esteem operates as an intervening variable between the behavior of others and the student's achievement.

These hypotheses will first be examined in terms of a three variable path model with reinforcement as the independent variable. A second analysis will be performed with the control variables sex, race and SES included in the model.

To explicate how these hypotheses will be tested, the reader is reminded of the questions raised in Chapter I concerning the relationship of reinforcement to changes in self-concept/self-esteem, and achievement. Theoretically, the concern is with self-concept/self-esteem as potential intervening variables;
empirically, the concern is with change scores. To test these hypotheses, change scores were computed for self-concept of ability and self-esteem by subtracting the scores obtained in Phase I from those in Phase II. This process provides an indication of the effect of introducing a reinforcement program on self-concept of ability and self-esteem. Change scores for spelling performance were determined by subtracting mean performance in Phase III from mean performance in Phase II. The computation of change scores permits the determination of how a change in reinforcement is related to a change in self-concept, self-esteem, and achievement and how a change in self-concept and self-esteem relates to a change in achievement.

The general three variable model expressing the relevant relationships in hypotheses thirteen and fourteen is:

\[ X_2 = b_{21}X_1 + \epsilon_2 \]

\[ X_3 = b_{31}X_1 + b_{32}X_2 + \epsilon_2 \]

It is possible to sort out the direct influence of reinforcement on a change in achievement and the indirect influence via a change in self-concept or self-esteem using path analysis.
The total effect of reinforcement and change in self-concept or self-esteem on achievement can be evaluated. Whether the indirect effect of reinforcement is greater than its direct effect can be determined. The test equation is $P_{32}P_{21} = 0$. If $P_{32}P_{21} = 0$, there is no indirect link via $X_2$.

Figure I presents the path model for self-concept of ability.

### Figure I

Path Analysis of Model with Self-Concept of Ability as the Postulated Intervening Variable

- $MR^2 = 0.0068$
- $MR^2 = 0.0119$

The path between reinforcement and self-concept of ability is considered to be significantly different from zero (i.e. the standard error is not greater than two times the Beta weight). However, reinforcement accounts for an insignificant amount of the variance in the self-concept of ability change scores.
$P_{21}$ is equal to $-.008$ and is not large enough to suggest a causal link between reinforcement and achievement via self-concept. Therefore, it is concluded that self-concept of ability does not function as an intervening variable between reinforcement and achievement. Self-concept of ability constitutes a separate independent variable.

Figure II presents the path model for self-esteem.

**Figure II**
Path Analysis of Model with Self-Esteem Postulated as the Intervening Variable

\[ MR^2 = .0091 \]
\[ .9955 \]
\[ X_2 \]

Self-Esteem
(Phase II - Phase I)

\[ -.0952 \]
\[ (.1142) \]
\[ X_1 \]

Reinforcement

\[ -.0581 \]
\[ (.1140) \]
\[ X_3 \]

Spelling
(Phase III - Phase II)

\[ .9830 \]
\[ MR^2 = .0336 \]

While the direct path $P_{21}$ is large enough to be considered significant, reinforcement accounts for a very small amount of the variance in the self-esteem change scores. $P_{32}P_{21}$ is equal to $.017$ and is small enough to suggest that it is not significantly

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different from zero. Thus, as in the case of self-concept of ability, self-esteem functions as a relatively independent variable and not as an intervening variable between reinforcement and achievement.

The general model expressing the theoretically relevant paths, with the control variables sex, race, and SES included is:

\[
\begin{align*}
X_1 & \rightarrow X_6 \\
X_2 & \rightarrow X_5 \\
X_3 & \rightarrow X_4 \\
X_4 & \rightarrow X_5 \\
X_5 & = b_{51}X_1 + b_{52}X_2 + b_{53}X_3 + b_{54}X_4 + e_5 \\
X_6 & = b_{61}X_1 + b_{62}X_2 + b_{63}X_3 + b_{64}X_4 + b_{65}X_5 + e_6
\end{align*}
\]

The test equation is the same as previously indicated except for the subscripts: \( P_{69}P_{54} = 0 \). If \( P_{65}P_{54} = 0 \), there is no indirect link between \( X_4 \) and \( X_6 \) via \( X_5 \).

Figure III shows the direct path between reinforcement and spelling to be larger than the indirect path via self-concept of ability \( (P_{65}P_{54} = -.013) \). While the direct path between reinforcement and self-concept of ability is relatively large, the indirect path is not enough different from zero to suggest that self-concept of ability is functioning as an
intermediate variable between reinforcement and spelling.

Figure IV shows the direct path between reinforcement and spelling to be larger than the indirect path via self-esteem ($P_{55}P_{54} = .008$). In this model, the direct path from reinforcement to self-esteem is not significantly large while the direct path from self-esteem to spelling is. The indirect path between reinforcement and spelling is not large enough to suggest that self-esteem is functioning as an intervening variable.

The analyses all lead to the rejection of hypotheses thirteen and fourteen. In each model, self-concept of ability and self-esteem function largely as independent rather than intervening variables.

The hypotheses were, also, tested utilizing self-concept of ability with respect to spelling as the postulated intervening variable. The results, presented in Figures V and VI, lead to the same conclusion. Self-concept of ability with respect to spelling does not generally function as an intervening variable between reinforcement and achievement.

Further evidence as to the possible differential impact of reinforcement on self-concept, self-esteem, and achievement for black and white pupils is available through a separate path analysis of these variables and the controls for each racial group. The results of these analyses are presented in Figures VII through XII.

The direct effect of reinforcement on spelling performance in the self-concept of ability model is similarly insignificant for
Figure III

Path Analysis of Model with Self-Concept of Ability, Sex, Race, and SES

\[ MR^2 = .0234 \]

\[ .9882 \]

\[ .0972 \quad (\text{Sex}) \]

\[ .0626 \quad (\text{Race}) \]

\[ .0294 \quad (\text{Self-Concept of Ability}) \]

\[ .0665 \quad (\text{Self-Concept of Ability}) \]

\[ .1995 \quad (\text{Self-Concept of Ability}) \]

\[ .1016 \quad (\text{SES}) \]

\[ .985 \quad (\text{Spelling (Phase III - Phase II)}) \]

\[ .0361 \quad (\text{Reinforcement}) \]

\[ .9522 \quad (\text{MR}^2 = .0491) \]

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Figure IV

Path Analysis of Model with Self-Esteem, Sex, Race, and SES

\[ \text{MR}^2 = 0.0470 \]

.. .9762

\[ X_1 \rightarrow 0.0900 \quad (0.1176) \quad X_6 \]

Sex

Spelling (Phase III - Phase II)

\[ X_2 \quad 0.0744 \quad (0.1248) \quad X_4 \]

Race

\[ X_3 \rightarrow 0.2582 \quad (0.1245) \quad X_5 \]

SES

\[ \text{Self-Esteem} \ (\text{Phase II - Phase I}) \]

\[ \text{Reinforcement} \]

\[ \text{MR}^2 = 0.0667 \]

---

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blacks and whites. The direct effect of reinforcement on self-concept of ability is dissimilar. The direct effect for whites is relatively large and positive while for blacks it is smaller in absolute value and negative. The direct effect of self-concept of ability is relatively large and negative for whites but smaller in absolute value and positive for blacks. Reinforcement has a larger negative indirect effect on spelling for whites than for blacks ( -.0695 as opposed to -.0148).

The direct effect of reinforcement on spelling performance in the self-esteem model is dissimilar for blacks and whites. It is negative and insignificant for blacks and only somewhat more
Path Analysis of Model with Self-Concept of Ability (Spelling), Sex, Race, and SES

\[ MR^2 = .0158 \]

\[ .9921 \]

\[ X_1 \rightarrow X_6 \quad .0859 \quad (.1203) \]

\[ X_2 \rightarrow X_6 \quad .0716 \quad (.1304) \]

\[ X_3 \rightarrow X_5 \quad -.2011 \quad (.1239) \]

\[ X_4 \rightarrow X_5 \quad -.0447 \quad (.1222) \]

\[ X_5 \rightarrow X_6 \quad .1117 \quad (.1369) \]

\[ X_6 \rightarrow \text{Spelling} \quad (\text{Phase III - Phase II}) \]

\[ X_1 \rightarrow \text{Spelling} \quad (.871) \]

\[ X_2 \rightarrow \text{Spelling} \quad (.0341) \quad (.1510) \]

\[ X_3 \rightarrow \text{Spelling} \quad (.1135) \quad (.150) \]

\[ X_4 \rightarrow \text{Spelling} \quad (.2567) \quad (.1249) \]

\[ X_5 \rightarrow \text{Spelling} \quad (.1415) \quad (.1216) \]

\[ MR^2 = .0756 \]
Figure VII

Path Analysis of Model with Black Self-Concept of Ability, Sex, and SES

MR^2 = 0.0218

Sex -> Spelling (Phase III - Phase II) -> Self-Concept of Ability (Phase II - Phase I)

MR^2 = 0.0908

Figure VIII

Path Analysis of Model with White Self-Concept of Ability, Sex, and SES

MR^2 = 0.1774

Sex -> Spelling (Phase III - Phase II) -> Self-Concept of Ability (Phase II - Phase I)

MR^2 = 0.0541

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Figure IX
Path Analysis of Model with Black Self-Esteem, Sex, and SES

MR² = .0118
.9941

Sex → .0758 ( Phase III - Phase II ) → Spelling (.9563)
(Phase II - Phase I) = .0826 (.9538)
SES → -.1845 (.1864)

MR² = .0715
.9636

Figure X
Path Analysis of Model with White Self-Esteem, Sex, and SES

MR² = .2302
.8774

Sex → .2520 ( Phase III - Phase II ) → Spelling (.9563)
(Phase II - Phase I) = .0728 (.9563)
SES → -.3502 (.1642)

MR² = .1149
.9408
Figure XI
Path Analysis of Model with Black Self-Concept of Ability (Spelling), Sex, and SES

\[ MR^2 = .0349 \]

\[ .0349 \]

\[ .9824 \]

\[ .0408 \]

\[ (.1973) \]

\[ -.0173 \]

\[ (.2072) \]

\[ .0282 \]

\[ (.1921) \]

\[ .1685 \]

\[ (.2062) \]

\[ Reinforcement \]

\[ .9168 \]

\[ MR^2 = .1595 \]

Figure XII
Path Analysis of Model with White Self-Concept of Ability (Spelling), Sex, and SES

\[ MR^2 = .1874 \]

\[ .1874 \]

\[ .9014 \]

\[ .2230 \]

\[ (.1458) \]

\[ .1704 \]

\[ (.1600) \]

\[ -.2811 \]

\[ (.1422) \]

\[ Reinforcement \]

\[ .9903 \]

\[ MR^2 = .0193 \]
significant for whites. The direct effect of reinforcement on self-esteem is also dissimilar. It is insignificant and positive for whites but negative for blacks and more significant. The direct effect of self-esteem on spelling is negative for both blacks and whites but it is insignificant for blacks. The indirect effect of reinforcement is very small for both blacks and whites.

Thus, generally, reinforcement had a more negative direct effect on the spelling performance of whites than blacks. And, it had a more positive direct effect on self-esteem and self-concept. These findings are essentially the same for self-concept of ability with respect to spelling.
CHAPTER IV
DISCUSSION

The first objective of this study was to ascertain whether the self-esteem and self-concept of black and white elementary pupils is significantly different. The data demonstrated that black and white self-esteem and self-concept of ability scores are not significantly different. These findings are consistent with those of Healey (1970), McElroy (1971), White and Richmond (1970), Sisenwein (1970), and Coleman (1966).

These data are not supportive of the view that living in a racist system has a profound differential negative effect on black children compared to white children. Whether living in a racist system has an absolute negative psychological effect on either black or white children will remain indeterminate until samples of black and white children can be obtained from non-racist social systems.

Proceeding on the assumption that the U.S. Society is racist, the question is raised as to how black children can maintain levels of self-esteem and self-concept of ability relatively similar to whites. Several answers have been suggested and since the present study was not directed towards answering this particular question it can only be examined on a theoretical level.

Baughman (1971) contends that blacks take a deterministic
view of the racist social structure. Personal problems are viewed as public issues rather than as personal problems. If this argument was true then one might at least expect the self-esteem of blacks to be much higher than that of whites. It is suggested that the assumption that blacks currently view the social structure more deterministically than whites is at best tenuous. Assuming that blacks and whites are equally deterministic in their views of reality does not lead to differential expectations concerning their self-esteem. The possibility exists that people who view the social structure in a deterministic fashion, may also view themselves as simply insignificant cogs in a very large machine and of little value. This is also equally applicable to black and white persons and leads to the prediction of similar levels of self-esteem.

Other suggestions as to why the self-esteem of black and white children are relatively similar have been made by Rosenberg and Simmons (1971:39-40). First, a large number of children may not be totally aware of the true position of their group in the ethnic stratification system. Also, an inflation mechanism is often operative in a person's perceptions of his group's ranking. Secondly, if a person views his group as inferior, it does not necessarily mean that the individual must view himself as personally unworthy. Third, even though the child fully realizes how unfavorably his group is viewed in the larger society this does not mean that the child believes that these stereotypical traits characterize him personally.

In terms of Rosenberg and Simmon's suggestions, if
every black person took all of the various stereotypical traits perpetrated by white people personally then indeed self-esteem should be negatively affected. However, this possibility ignores the existence of a black community with black parents, siblings, peers, heroes, etc. It denies the operation of certain psychological processes, such as selective perception and retention. It ignores the existence of a subculture which has emerged out of the experience of living in a racist system. Black people construct reality out of their own experience which permits the maintenance of relatively high levels of self-esteem. The traditional view has been somewhat presumptuous in believing that the black's "significant other" was white.

The second objective of this study was to determine the extent to which self-esteem and self-concept are related to achievement. Both self-esteem and self-concept of ability were found to be significantly correlated with spelling performance. Self-concept of ability was shown to be a significant predictor of spelling performance. Self-esteem was demonstrated to be a significant predictor in one case but not in another. These results are in agreement with those of Brookover, et. al. (1964), Brookover, et. al. (1967), Wattenberg and Clifford (1964), Epps (1969), Coleman (1966), Rosenberg and Simmons (1971), Lang (1971), Singh (1973), Sidawi (1971), Nelson (1971), Cummings (1971), Kern (1971), Miller (1971), Frerichs (1971), Lewis (1971), Padelford (1970), Morrison, et. al. (1973), Goodman (1971), Krupczak (1973), and Kunce (1972).
The data support the contention of Brookover and Gottlieb (1964) that the extent to which a child believes he is able to learn affects his performance. The more the child perceives he is able to learn the more he learns. While the data support the derived hypothesis it should be pointed out that performance is also a good predictor of self-concept of ability. If self-concept of ability is regressed on antecedent spelling performance relatively large regression coefficients are obtained. While there are certainly grounds for arguing that performance causes self-concept of ability, it is emphasized that this study was theoretically concerned with examining self-concept of ability as a cause of performance. To this end the study was designed so that measured self-concept of ability and self-esteem were actually antecedent to performance and thus a legitimate test of the hypothesized relationships was possible.

The data also support the argument that self-esteem affects achievement. To the extent that a person has a healthy self-esteem, maintains an attitude of approval towards oneself, believes oneself to be worthy and significant then the person will be able to perform relatively well.

The third objective of this study was to ascertain the relationship between reinforcement and achievement. The data indicate that no statistically significant changes in spelling performance resulted from the implementation of either candy reinforcement or verbal approval programs in the classroom situation. These results are contradictory to the general
reinforcement literature with the exception of Benson (1970),
Lowe (1973), and Bennie (1970).

The major problem with these results is that they defy any overall general interpretation. For instance, if Candy (1) and Praise (1) are eliminated an appropriate generalization might be that it takes children a while to get adjusted to school, thus the low spelling performance during Phase I is understandable. In the middle of the school year, the children are fairly well adjusted to the routine, their interest has peaked and their spelling performance is high. Towards the end of the year, interest drops off; teachers become disappointed and bored; and, spelling performance drops off. However, Candy (1) does not fit this interpretation.

Another interpretation might be that there were differences in the control and experimental groups, even though the general curvilinear trend is similar. Possibly the experimental manipulation was effective, significant changes did occur but the children satiated after a few trials under reinforcement. Again, Candy (1) does not fit the generalization.

If it is assumed that important, but not statistically significant, change occurred due to experimental manipulation and that this change occurred between Phase I and Phase II for two experimental groups and between Phase II and Phase III for one experimental group then it must follow that other variables are operating. That the classrooms themselves were very different has already been mentioned. Considering this piece of information,
an analysis of variance was performed on all of the classrooms with repeated measures on spelling for Phase I and Phase II only. A F value of 6.53 (p = .0000) was obtained for the main effect of classroom. The analysis was repeated with Candy (1) and (2) combined into one group and Praise (1) eliminated. Again, the main effect of classroom was significant (F = 7.049, p = .002).

The classroom, as a variable, does make a significant contribution towards explaining the variance in spelling. Although, from the date, little can be said about what it is about the classrooms that makes the difference. It might be argued that the probability is greater that those classrooms with low initial mean spelling test scores would improve. This argument does not hold since the control group with the highest initial mean spelling test score experienced an increase in performance between Phase I and Phase II, while Candy (1) with the second largest mean score experienced a decrease and the three remaining experimental groups experienced increases. Similar problems occur if the argument is advanced that classrooms with low self-esteem or self-concept of ability scores are more likely to experience an increase in spelling performance.

If it is assumed that the changes which did occur are not significant, statistically or otherwise, then the discussion must proceed in a different direction. If no change occurred then it must be due to some aspect of the reinforcement procedure.

In operant research where subjects are used as their own controls baselining is necessary to determine whether a change occurs.
This requires that a stable response rate be established for the organism so that the response rate subsequent to the introduction of the independent variable can be evaluated. It was not possible in this study to insure that a stable response rate had been attained by the subjects in each classroom due to time limitations and various other exigencies. Therefore an arbitrary number of observations were determined to constitute the baseline measure.

In no way, however, can the first four spelling test scores for each classroom be regarded as stable. For instance, Figure XIII shows Candy (l) to be experiencing a decline in mean performance throughout the baseline period. The only group that is approximately stable during the baseline period is the control group. The immediate problem produced by an inadequate baseline measure is that one does not know whether response rates subsequent to the introduction of the independent variable are a function of the independent variable or some other variable. For instance, Figure XIII shows Candy (l) experienced an increase in mean performance from test 4 to test 5 which is maintained through tests 6 and 7. Since mean performance had not stabilized during Phase I there is no real way to interpret the results in Phase II. Perhaps the gain from test 4 to test 5 is due to the introduction of the reinforcement procedure or perhaps to something else. This problem is always present but it is even more serious when a stable baseline measure has not been attained.

Another limitation is that a shaping procedure was not included as part of the design. Children were expected to perform
Figure XIII

Mean Spelling Test Scores for each Classroom

Spelling Test Number
at higher levels without any programmed movement from the level at which they operated to a perfect score. For example, some of the children consistently obtained low spelling test scores, and the way the token system was designed these children were reinforced for performing at a low level rather than being shaped to obtain perfect test scores and then reinforced for such performance.

The question is raised as to whether an appropriate reinforcer (i.e., candy or praise) was utilized. By definition, since a significant change did not occur in spelling test performance candy and praise did not function as adequate reinforcers. When working with animals in the laboratory it is possible to keep the animals at 80 percent of their free feed weight. Since this is not possible with children there is the possibility that an M and M may not have the same reinforcing value for a well-fed child that a Noyes pellet has for a hungry rat. But, research indicates that children will work for candy so this does not appear to be the problem. Another possibility is that the children were satiated on candy not because they were not physically hungry, although this might have been the case, but because they received candy for so many other things that it ceased to be an appropriate reinforcer. In Candy (1) the children received candy for doing well in the Learning Unlimited program. In Candy (2) they also obtained candy for returning from recess on time, behaving well while going to the restroom or getting a drink of water, etc.

With respect to verbal praise there is the question of whether the various words and phrases utilized by the teachers had
acquired reinforcing properties for the children. Without knowing the reinforcement history of each child it is impossible to know if the words had acquired secondary reinforcement properties through appropriate pairing with primary reinforcers.

From the operant perspective, the attitudes of the children towards receiving candy and verbal praise is not really a problem. However, from other perspectives it is. Impressionistic evidence can only be offered here. When the teacher in Candy (2) gave candy or peanuts to those children who returned on time from recess, those who were usually tardy often had a derogatory comment for those who returned on time. The implication is that it was more acceptable to some of the children to be tardy and have a good time in doing so than to be on time and receive a peanut.

The teacher in Praise (2) expressed the belief that her words did not appear sincere to her. If they did not appear sincere to the teacher then there is a real possibility that they did not appear sincere to the children either. It has previously been pointed out that it was often difficult for the researcher to tell if the teacher meant to indicate his approval with certain words or simply indicate that it was time to proceed to something else.

Related to this issue is the teacher's attitude towards reinforcement in the candy condition. The teacher in Candy (2) used the candy in her words as a "motivator". She played up the idea of performing well on the spelling tests so that the maximum amount of candy could be obtained. She also had several practice trials before the test to improve the children's performance.
In Candy (1) the attitude of the teacher was one of detachment from the reinforcement procedure. She was never heard to say anything about doing well on the spelling tests in order to receive the maximum amount of candy. Trial tests were not taken in Candy (1). Another difference was that the teacher in Candy (1) passed out the candy on Friday afternoons while the teacher in Candy (2) reinforced the children as soon after the test as possible.

When working with animals the conditioning process usually occurs everyday and sessions may be relatively long. Those who obtain significant results with behavior modification procedures on human subjects also often work on a daily schedule. In this study there were long periods of time between reinforcement in the candy experimental groups. In some cases the children went for a period of a month without taking a spelling test or being reinforced. Secondly, when a test was given the actual process only took a few minutes.

In the verbal approval situation praise was given daily for spelling related behavior. However, in a 25 minute spelling session there is not enough time for each child to make more than a few responses and be reinforced. Even when the teacher is delivering verbal approval at the relatively high rate of one response per minute, if the classroom has 25 children in it, each child gets an average of only one reinforcement in a 25 minute period, hardly a significant number of reinforcers. The reinforcement schedule was too intermittent in both the candy and verbal approval conditions.

The fourth objective of this study was to ascertain whether
a change in reinforcement would produce a change in self-concept and/or self-esteem. The data indicate that implementation of a reinforcement program had few significant effects on self-esteem or self-concept of ability. No significant change occurred in self-concept of ability with respect to spelling. These results are in contradiction to the generally reported findings with the exception of Williams (1973).

The only statistically significant change in self-concept of ability in an experimental group occurred in Praise (2). In this classroom the teacher more than doubled her mean rate of verbal approval from Phase I to Phase II. Candy (2) also showed a large, but not statistically significant, increase. It is suggested that the same reasons that account for the lack of a statistically significant positive relationship between reinforcement and achievement also accounts for the general lack of a strong positive relationship between reinforcement and self-esteem, self-concept of ability, and especially self-concept of ability with respect to spelling.

The fifth objective was to ascertain whether self-concept and/or self-esteem and reinforcement interact to produce differential levels of achievement. The data suggest that neither the interaction between self-concept of ability and reinforcement nor self-esteem and reinforcement is statistically significant. These results contradict those of Gelfand (1962). Children with low self-esteem or low self-concept of ability were not found to make significantly greater gains in achievement than those with high self-esteem or high self-concept of ability. The analysis showed
self-concept of ability and self-esteem, but not reinforcement, to have significant main effects. Thus, the question of whether self-concept of ability and/or self-esteem interact with reinforcement must remain unanswered on the basis of these data.

The sixth objective was to ascertain whether changes in reinforcement differentially affects the self-esteem, self-concept, or achievement of black and white pupils. The data demonstrate that the interaction between race and reinforcement was not significant when self-concept, self-esteem, and achievement were considered as dependent variables. Therefore, whether reinforcement differentially affects these variables with respect to black and white pupils remains undetermined.

The seventh objective of this study was to determine whether self-concept and/or self-esteem function as intervening variables between stimuli in the environment and achievement. Path analysis of the data strongly suggests that self-concept of ability and self-esteem do not operate as intervening variables between reinforcement and achievement but as independent variables. The data do not support those theorists who argue that self-concept and self-esteem function as intervening variables between stimulus and response.

Care must be taken, however, in interpreting these data since it is already known that implementation of the reinforcement program generally did not result in any statistically significant changes in spelling, self-esteem, or self-concept of ability. This is reflected in the size of the Beta weights in the path models.
Thus, if the rule of thumb for significance of Beta weights (standard error less than two times the Beta weight) is applied it cannot be generally argued, on the basis of these data, that reinforcement is really a significant independent variable.

In order to test hypotheses thirteen and fourteen a temporal ordering of the variables was required. Thus, data collection and implementation of the reinforcement program were organized so that the required data could be collected. However, problems already discussed also affected this analysis. The main one being that Candy (1) experienced a significant increase in spelling performance while Candy (2) and Praise (2) experienced a decrease. That other variables are operative has already been suggested. The addition of the control variables sex, race, and SES did not have any major effect upon the direct effect of reinforcement. Therefore, on the basis of these data the negative direct effect of reinforcement cannot be explained.

It was indicated in Chapter II that the five classrooms were initially significantly different. Considering this piece of information the data were reanalyzed with classroom entered into the model as a dummy variable. Figure XIV shows that, when classroom is considered, the direct effect of reinforcement is changed to a slightly positive effect and the indirect effect via self-concept of ability for all practical purposes is completely eliminated. Also the direct effect of self-concept of ability is reduced to insignificance.
Figure XIV
Path Analysis of Model with Self-Concept of Ability, Classroom, Sex, Race, and SES

$MR^2 = .1338$

Praise (2) → Spelling (Phase III - Phase II)

Candy (1) → Sex

Candy (2) → Candy (2)

Reinforcement

Sex → Race

Race → Self-Concept of Ability (Phase II - Phase I)

SES → .0270 (.1308)

$MR^2 = .0979$

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Separate path analyses of the data for blacks and whites resulted in the appearance of a few dissimilarities. The direct effect of reinforcement was negative and small in all cases. But the direct effect for whites was larger in absolute value. The insignificance of the path coefficients preclude any definitive conclusions. Thus, if there are any grounds for the hypothesized differential impact of reinforcement upon the spelling performance of blacks they are at best tenuous.

In the final section of Chapter I three questions were raised concerning the relationship between reinforcement and change in self-concept, self-esteem, and achievement. Based upon the data reported in this study the answer is no to all three questions. Essentially reinforcement was found to have no significant effect on either self-concept, self-esteem, or achievement. Therefore, it also does not produce simultaneous changes in self-concept, self-esteem, and achievement. Nor does it produce change at differential rates, or produce a change in self-concept and/or self-esteem which then produces a change in achievement. It remains for other researchers to demonstrate that these questions can be answered in the affirmative.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Two major questions have guided this study. What is the explanation for the relatively lower level of achievement of black elementary school pupils compared to whites? What is the relationship between reinforcement, self-concept and self-esteem, and achievement? The literature was examined and it was concluded that the often held belief that blacks suffer from lowered self-concepts and self-esteem due to living in a racist system is not totally supported empirically. Assuming that the literature which shows blacks and whites to be relatively similar with respect to self-concept and self-esteem accurately describes reality then these variables cannot be utilized to explain differential levels of achievement for blacks and whites. This study focused upon reinforcement as a possible explanation for differential achievement. Self-concept and self-esteem were investigated to determine their relationship to achievement and reinforcement. Theoretically, the study worked in terms of self-concept, self-esteem, and operant perspectives, essentially attempting to evaluate the comparative utility of the three approaches.

The original 29-item instrument composed of items from the Michigan State University Self-Concept of Ability instrument and the Coopersmith Self Esteem Inventory was determined to be multidimensional through factor analysis. Factor analysis was utilized inductively to dimensionally simplify the original
instrument. This process resulted in a 15-item instrument with two relatively distinct subscales. One subscale was defined as self-concept of ability after the instrument from which the items were taken. The second subscale was defined as self-esteem.

Five classrooms were involved in the study which can best be described as a field experiment. In two classrooms, a token system with candy as a backup reinforcer was implemented. In two others, the rate of teacher verbal approval was manipulated. The fifth classroom functioned as a control. The research design was organized into three phases. During Phase I, baseline information was collected on spelling performance, verbal approval, self-concept, and self-esteem. Beginning with Phase II the reinforcement program was implemented. The program was continued through Phase III. Spelling performance, verbal approval, self-concept, and self-esteem were measured in Phase II and III.

The findings were:

1. The self-esteem and self-concept of blacks and whites were not significantly different.

2. Both self-esteem and self-concept are significantly associated with achievement.

3. The implementation of a reinforcement program did not produce any significant changes in achievement or self-esteem. It did produce a significant change in self-concept in one experimental group.

4. Significant interaction effects were not found to exist between self-concept and reinforcement or self-esteem and
reinforcement with achievement as the dependent variable.

5. Reinforcement did not have a differential impact on the self-esteem, self-concept, or achievement of blacks compared to whites.

6. Self-concept and self-esteem were found to operate as relatively independent variables rather than as intervening variables between reinforcement and achievement.

7. Reinforcement had a negative effect on achievement and this effect was generally more negative for whites than blacks.

Limitations applicable to this study include nonrandom selection of sample, assignment of classrooms to experimental or control conditions, and assignment of teachers and subjects to classrooms. These limitations severely restrict the generalizability and interpretability of the findings. The sample can be said to constitute the population and results are therefore generally restricted to the sample studied. Interpretation of results through the use of inferential statistics and tests of significance is highly tenuous given sample selection and assignment of subjects. At best they can only be used in a suggestive fashion rather than as decisional criteria.

A second limitation is in terms of adequately implementing the reinforcement program and operationalizing the methodology associated with operant psychology in field experiments. Negative and nonsignificant results were attributed to such inadequacies as the absence of a shaping procedure, inadequate baseline measures, too long of an intertrial interval, satiation, the selection of
ineffective reinforcers, and a reinforcement schedule characterized as too intermittent. These inadequacies in combination with those of nonrandom sampling and placement, and the absence of a sufficient consideration of control variables or a reversal leaves the researcher in the awkward position of not knowing for sure why certain results appear to be significant and others not significant.

A third limitation is in terms of the instrument used to measure self-concept and self-esteem. Several children expressed a lack of understanding of some of the words used in the items. Secondly, some children had difficulty in thinking in terms of a continuum and undemarcated intervals. Thirdly, there is the problem of whether the instrument was in reality measuring the dimensions, if any, that were changing. There may have been some aspect of self-esteem which changed drastically due to reinforcement but it was not tapped by the self-esteem subscale. In terms of comparing black and white self-concept and self-esteem there is the possibility that on the dimensions measured black and white elementary pupils may be quite similar but on more global measures, or measures which tap other dimensions, they may be very dissimilar.

Whether self-concept and/or self-esteem empirically function as intervening variables between stimulus and response, or independent variables, and whether the reason blacks achieve less than whites is due to differential reinforcement has not been adequately answered by the present research. Thus, it remains for further researchers to determine the exact relationships. It is recommended that if the research is replicated in the field that
the researcher attempt to operationalize the operant methodology much more exactly than was accomplished or even possible in this study. Secondly it is recommended that the research be replicated in a laboratory situation where maximal control over the relevant variables can be realized.

The major implication of this study for education is that if a reinforcement program is to be successfully implemented in a classroom setting it must be maximally planned and coordinated, otherwise, the probability is relatively high that its effect on the performance of the children will be negligible.

The methodological enervation of this study does not depreciate the importance of the theoretical issues explicated. Whether self-concept or self-esteem mediate between observable external stimuli and responses is a theoretical issue which must be empirically resolved. This study constitutes one of the few attempts to design an experiment and apply the necessary statistical procedures towards this end. The negligible results of this study should in no way preclude further research on the relationships among reinforcement, self-concept, self-esteem, and performance, whether it be spelling or some other behavior.
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APPENDIX A

Letter to Parents

This letter is to request your permission to allow your child to fill out a self-concept questionnaire in connection with a study conducted by Mr. Kirby Throckmorton, a graduate student in Sociology at Western Michigan University. With your permission, this questionnaire will be administered five times during the 1974-75 school year.

The purpose of Mr. Throckmorton's study is to observe how differences in teaching styles relate to student performance and self-concept. Your child's teacher has agreed to allow Mr. Throckmorton to observe his teaching performance in the classroom. The study itself has been approved by the Director of Research and the Director of Elementary Schools at the Grand Rapids Public Schools, as well as the Center for Educational Studies. The study has potential value in helping educators to better plan effective programs for teaching and learning.

The study will include 125 students enrolled in the Grand Rapids Public Schools. No individual student will be identified in the analysis and reporting of the study. Each administration of the self-concept questionnaire should take about 15 minutes.

If you would like further information about this study, please contact me or some other member of the staff of the Center for Educational Studies, 110 Ionia Ave., N.W., phone 456-4780, preferably on Tuesday or Thursday.

We hope that you will give permission for your child to participate. Please indicate your decision by signing in one of the blank spaces at the bottom of this sheet, and send the sheet back to school with your child. Thank you.

(Please return this to the teacher as soon as possible)

Name of Child:

Signature of parent (sign one of the following):

Permission Granted

Permission Not Granted

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APPENDIX B

General Questionnaire

1. Name:

2. Date of Birth:

3. Present Grade Level:

4. Father's or Guardian's Occupation:

5. Mother's or Guardian's Occupation:

If you do not know exactly what your father's, mother's, or guardian's occupation is please write a brief description about what they do at work. If they are currently unemployed please indicate what their occupation was before they became unemployed. Do not write down where they work.
## APPENDIX C

### Behavior Rating Form

1. Does this child adapt easily to new situations, feel comfortable in new settings, enter easily into new activities?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

2. Does this child hesitate to express his opinions, as evidenced by extreme caution, failure to contribute, or a subdued manner in speaking situations?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

3. Does this child become upset by failures or other strong stresses as evidenced by such behaviors as pouting, whining, or withdrawing?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

4. How often is this child chosen for activities by his/her classmates? Is his/her companionship sought for and valued?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

5. Does this child become alarmed or frightened easily? Does he/she become very restless or jittery when procedures are changed, exams are scheduled or strange individuals are in the room?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

6. Does this child seek much support and reassurance from his peers or the teacher, as evidenced by seeking their nearness or frequent inquiries as to whether he is doing well?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

7. When this child is scolded or criticized, does he become either very aggressive or very sullen and withdrawn?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

8. Does this child deprecate his school work, grades, activities, and work products? Does he indicate he is not doing as well as expected?
   - Always
   - Usually
   - Sometimes
   - Seldom
   - Never

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9. Does this child show confidence and assurance in his actions toward his/her teachers and classmates?
   ___always    ___usually    ___sometimes    ___seldom    ___never

10. Does this child publicly brag or boast about his exploits?
    ___always    ___usually    ___sometimes    ___seldom    ___never

11. Does this child attempt to dominate or bully other children?
    ___always    ___usually    ___sometimes    ___seldom    ___never

12. Does this child continually seek attention, as evidenced by such behaviors as speaking out of turn and making unnecessary noises?
    ___always    ___usually    ___sometimes    ___seldom    ___never

13. To what extent does this child show a sense of self-esteem, self-respect, and appreciation of his own worthiness?
    ___very strong    ___strong    ___medium    ___mild    ___weak
APPENDIX D
Self Esteem Instrument

1. How do you rate yourself in school ability compared with your close friends?
   among the poorest ____________________________ among the best

2. How do you rate your ability in spelling compared with those in your class?
   among the poorest ____________________________ among the best

3. Forget for a moment how others grade your work. In your opinion how good do you think your work is in mathematics?
   much below ____________________________ excellent
   average ____________________________

4. I'm a lot of fun to be with.
   very much like me ____________________________ not like me

5. I always do the right thing.
   very much like me ____________________________ not like me

6. My teacher makes me feel I'm not good enough.
   very much like me ____________________________ not like me

7. How do you rate yourself in school ability compared with those in your class at school?
   among the poorest ____________________________ among the best

8. I'm proud of my school work.
   very much like me ____________________________ not like me
9. I don't care what happens to me.
   very much like me _____________________________
   very much not like me

10. How do you rate your ability in mathematics compared with those in your class?
    among the poorest _____________________________
    among the best

11. I can usually take care of myself.
    very much like me _____________________________
    very much not like me

12. I'm a failure.
    very much like me _____________________________
    very much not like me

13. I'm pretty happy.
    very much like me _____________________________
    very much not like me

14. Forget for a moment how others grade your work? In your opinion how good do you think your work is?
    much below average _____________________________
    excellent

15. I would rather play with children younger than me.
    very much like me _____________________________
    very much not like me

16. How do you rate you ability in spelling compared with your close friends?
    among the poorest _____________________________
    among the best

17. I like to be called on in class.
    very much like me _____________________________
    very much not like me
18. Things are all mixed up in my life.
very much like me _____________________________________ very much not like me

19. I can make up my mind and stick to it.
very much like me _____________________________________ very much not like me

20. Forget for a moment how others grade your work. In your opinion how good do you think your work is in spelling?
much below average _____________________________________ excellent

21. I have a low opinion of myself.
very much like me _____________________________________ very much not like me

22. I often feel ashamed of myself.
very much like me _____________________________________ very much not like me

23. If I have something to say, I usually say it.
very much like me _____________________________________ very much not like me

24. How do you rate your ability in mathematics compared with your close friends?
among the poorest _____________________________________ among the best

25. Most people are better liked than I am.
very much like me _____________________________________ very much not like me

26. I always know what to say to people.
very much like me _____________________________________ very much not like me
27. I often get discouraged in school.

very much ______________________________________________________________________
like me ________________________________________ not like me

28. Things usually don't bother me.

very much ______________________________________________________________________
like me ________________________________________ not like me

29. I can't be depended on.

very much ______________________________________________________________________
like me ________________________________________ not like me
## APPENDIX E

Correlation Matrix of Major Variables for those Subjects for which Complete Information was Available (n=78)

<table>
<thead>
<tr>
<th></th>
<th>Sex</th>
<th>Race</th>
<th>SES</th>
<th>Reinforcement</th>
<th>Spelling (Phase III) Minus Spelling (Phase II)</th>
<th>Self-Concept of Ability (Phase II) Minus Self-Concept of Ability (Phase I)</th>
<th>Self-Esteem (Phase II) Minus Self-Esteem (Phase I)</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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<td>3</td>
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<td>4</td>
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<td>5</td>
<td>Spelling (Phase III) Minus Spelling (Phase II)</td>
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<td>6</td>
<td>Self-Concept of Ability (Phase II) Minus Self-Concept of Ability (Phase I)</td>
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<td>-0.15</td>
<td>-0.03</td>
<td>0.08</td>
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<td>7</td>
<td>Self-Esteem (Phase II) Minus Self-Esteem (Phase I)</td>
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### Correlation Matrix of Major Variables for White Subjects (n=46)

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<td>4. Spelling (Phase III) Minus Spelling (Phase II)</td>
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<td>-0.03</td>
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<td>-0.11</td>
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### Correlation Matrix of Major Variables for Black Subjects (n=32)

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