1976

An Experimental Study of the Effects of a Mathematical Education Model on Self-Esteem of Male Prison Inmates.

George Alexander Roundtree

Louisiana State University and Agricultural & Mechanical College

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AN EXPERIMENTAL STUDY OF THE EFFECTS OF
A MATHEMATICAL EDUCATION MODEL ON
SELF-ESTEEM OF MALE PRISON INMATES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Education
in
The Department of Extension Education

by
George A. Roundtree
B.S., Louisiana State University, 1968
M.S.W., Louisiana State University, 1970
August, 1976
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ABSTRACT

The major objective of the study was to demonstrate through the use of a mathematical educational model whether the ability to perform successfully in the area of mathematics by male prison inmates would improve their self-esteem.

Forty male prisoners were selected from two settings. The participants for the experimental group were selected from inmates maintained at the Louisiana State Police Headquarters in Baton Rouge, Louisiana. The participants for the control group were selected from the Louisiana National Guard facility at Jackson Barracks in New Orleans, Louisiana.

Due to circumstances beyond the control of the researcher, a number of subjects in the experimental and control groups were transferred to other facilities. After the transfer of these subjects, the experimental group was composed of 22 subjects and the control group was composed of 31 subjects.

The experimental group inmates were tutored individually for forty-five minutes twice a week for eighteen weeks. Both groups were given three pre and post tests consisting of a math, reading, and a self-esteem test. Two way factorial analysis of variance, analysis of variance, and Pearson's product moment correlation were used to test the thirty-six null hypotheses that there were no differences in self-esteem, mathematical skills, and selected
socio-economic variables between the experimental and control group subjects.

Increases in self esteem and mathematical skills were significant statistically for the experimental group subjects. The race of the experimental group subjects did seem to be a factor; that is, Black subjects did seem to do better than did the White subjects relative to increases in self-esteem and mathematical skills. Those Black subjects who received no treatment had lower self-esteem scores and lower mathematics scores than did the White subjects who received no treatment.

The two major null hypotheses were rejected since statistically significant differences in self-esteem and mathematical skills were found to exist between the experimental and control groups. Two sets of sub-hypotheses were propounded. For the first set, concerned with both the experimental and control groups, fourteen of the sub-hypotheses were rejected as statistically significant differences in self-esteem and mathematical skills were found to exist between the experimental and control groups. The remaining eight sub-hypotheses relating to the experimental and control groups were accepted as no statistically significant differences in self-esteem and mathematical skills were found to exist between the groups. Regarding the twelve sub-hypotheses for the experimental group subjects, only eight of them were accepted as no statistically significant differences in self-esteem and mathematical skills were found to exist. For the remaining four
sub-hypotheses no decision could be made as to whether to accept or reject them because some of the cells had insufficient data.

It was concluded that since low self-esteem in male prisoners is a problem all prison administrators must deal with; more of this type of research was needed.

Essentially, this study has demonstrated that the experimental group subjects could and did increase their self-esteem and mathematical skills.

It was determined that the average experimental group subject was likely to be young, male, poorly educated, IQ of 90, from a poor family background, a user of alcohol and drugs and unskilled.

This profile was considered useful for personnel responsible for the conduction of rehabilitation programs in correctional facilities.

Suggestions were offered for utilizing the study results in correctional rehabilitative programs. It was also suggested that a replication study be conducted to determine if the same results could be obtained in different geographic and institutional settings before any generalizations were made based upon the findings of this study.
CHAPTER I
INTRODUCTION

There have been no studies conducted specifically to determine the effect of mathematics on the self-esteem of male prison inmates. However, a number of studies have been conducted to determine the effect possessing mathematical ability has on self-esteem in school populations, both male and female. Research has, however, been conducted to develop instruments to measure self-esteem in school and prison populations.

Although no studies have been conducted relative to the effect of mathematical ability on self-esteem of male prison inmates, there is reason to believe that the ability to successfully perform in the area of mathematics is related to the self-esteem of the male in general (64), and thus to the male prison inmate also. The explanation given for this relationship is that there is a cultural expectation that males should be able to successfully perform in the area of mathematics. To the degree that he is less able to successfully perform in the area of mathematics, a male will experience a sense of self-depreciation or a reduction in self-esteem. The results of one research study suggest that high scorers on the Math Attitude Scale tend to be more socially and intellectually mature, more self-controlled, and place more value on theoretical matters,
compared with low scorers on the scale(49). These findings suggest that attitude toward mathematics is related to a broad constellation of personality variables indicative of adjustment and interest. They also suggest that this type of personality would result in a person feeling comfortable with his self-image and thus a person who enjoyed a high level of self-esteem.

A faculty member of Louisiana State University has developed a diagnostic instrument for the purpose of diagnosing mathematical problem areas.¹ Based on the results of this mathematical diagnosis, a specific mathematics curriculum can be designed to enable a student to successfully learn mathematics.

In addition to increasing the person's skills in the area of mathematics, there have been other benefits derived from programs to increase a person's ability to perform mathematics. These added benefits, however, have been achieved with young children primarily. The teachers who have participated in the program to increase the mathematical ability in individuals have noticed a concomitant improvement in all other subject areas as well as a marked improvement in social functioning.²

It has been suggested that the improvement in social functioning was a result of increased self-esteem brought about by the ability

¹Dr. Sam Adams, Professor, College of Education, Louisiana State University, Baton Rouge, Louisiana.

²Although the inmates are chronologically adults, many of them function mentally, socially, and emotionally at a child's level in these areas. Therefore, the phenomenon that occurs with elementary school children in learning mathematics might reasonably be expected to occur in these adults.
of the individual to successfully perform in the area of mathematics.
It was, therefore, proposed that mathematics be used as a means of
increasing self-esteem in a prison population. If this could be
done then one of the basic long term problems of prison populations
could be ameliorated. For the above cited reasons it was felt that
a similarly designed program would greatly benefit the inmate pop-
ulation of a prison system.

Statement of the Problem

The number of crimes committed in the U.S. is steadily increas­
ing. Fear of crime in the streets and of economic loss to businessmen
and others has awakened public concern regarding this very serious
problem.

The various law enforcement agencies are aware that as high as
the crime rate is this is only representative of a proportion of
the crime committed; that is, many crimes that are committed are not
reported to the law enforcement agencies. However, the estimated
number of major crimes committed in the U.S. (not arrests) in 1975
was 8.6 million, with approximately 7.9 million arrests made for
lesser offenses (36).

Correctional officials have stated that many of the above cited
Crimes are committed by persons who have previously been incarcerated
(recidivists). In Louisiana there is evidence to support this belief.

The corrections specialization unit of the School of Social
Welfare of Louisiana State University has recently completed a study
of a sample population of inmates at the State Penitentiary at Angola, Louisiana (46). This institution has approximately 4,000 inmates within its walls and the recidivism rate at Angola is approximately 50 per cent.

The study previously mentioned (46) centered its focus on determining the characteristics of the confined inmate population and from the data an attempt is being made to develop rehabilitation models that would be appropriate for specific categories of inmates (i.e., drug users, alcoholics, violent offenders, etc.).

It has been determined through tests that approximately 53 per cent of these inmates had an educational level of fifth grade or less, 63 per cent had a sixth grade or less level and 82 per cent had less than a ninth grade level. The age at "first commitment" category indicated that approximately 83 per cent of these inmates were twenty-five years of age or younger, while approximately 93 per cent were below the age of thirty. Over two-thirds of the inmate population were either unskilled or semi-skilled. Twenty-five per cent of the inmates were reading at the third grade level or less, while 60 per cent were reading at the sixth grade level or less. Approximately one out of five persons in the sample population with an IQ of 111 and above was reading below the sixth grade level. Approximately 15 per cent of the total sample population had an IQ of 111 and above.

It is anticipated that data collected during this project will provide one means of reducing the recidivism rate of inmates confined
in Louisiana and possibly other states as well; that is, this research project is designed to develop an education rehabilitation model that will prove successful in reducing the recidivism rate of male prison inmates.

Objectives of the Study

The major objective of the study was to demonstrate through the use of a mathematical education model whether the ability to perform successfully in the area of mathematics by male prison inmates would improve their self-esteem or self-concept.

The following specific objectives were established:

1. To determine if there was a significant increase in mathematical skills following an intensive mathematical tutoring program.

2. To determine if there was a significant increase in self-concept following an intensive mathematical tutoring program.

3. To determine if there was a significant relationship between mathematical skills and self-concept.

4. To determine if there was significant differences in the mathematical skills of male penal inmates in relation to their socioeconomic profile characterized by their age, IQ, education, skilled trade and family income.
CHAPTER II
THEORETICAL FRAMEWORK

The major focus of this study was self-esteem and how self-esteem might be increased in a male prison population through expanding a person's ability to perform in the area of mathematics. Literature on the subject of self-esteem and its ramifications on personality development as well as how it relates to the social adjustment of individuals within various populations was reviewed to establish a theoretical base for the study.

As might be expected due to the recency of the previously mentioned mathematical development, there was very little directly related to this phenomenon in the literature. However, there were several research projects dealing with "self-esteem" within the prison setting. The relationship of "self-esteem" and mathematics has only been dealt with tangentially in the literature and then primarily in the area of children's performance.

A study conducted by Bennett (51), successfully adapted Coopersmith's "Self-Esteem Inventory (S.E.I.)" (51), to measure the self-esteem of prison inmates. Permission was obtained to use the scales in this project (Appendix E and Appendix F). Bennett called the SEI (modified) a Self-Attitude Inventory (SAI) (51), (13).

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1This refers to Dr. Sam Adams' "Adston Diagnostic Instruments". See Appendix B.
In a study of self-esteem two problems soon arise. One is the
definition of self-esteem and its separation from similar aspects
of personality such as self-acceptance and self-awareness. The next
problem that arises has to do with measuring self-esteem once it has
been defined.

Therefore, for this research project an attempt was made to
shorten the controversy that could easily be developed by semantic
nuances and the definition proposed by Gelfand and accepted by Wylie
(24) is as follows:

A person's characteristic evaluation of himself and what
he thinks of himself as an individual; low self-esteem
is characterized by a sense of personal inadequacy and an
inability to achieve need satisfaction in the past; high
self-esteem is defined by a sense of personal adequacy
and a sense of having achieved need satisfaction in the
past (24), (55, p. 260).

This approach to solving the semantic problem is consistent
with the approach of Coopersmith who defined self-esteem in terms
of evaluative attitudes toward self (13).

Other studies that deal with this subject include one by James
(16) and one by Mead (17), in which they develop compelling general
formulations concerning self-esteem and its antecedents. These
formulations appeared relatively early in the emergence of psychology
and sociology. Although neither man devoted himself extensively
or specifically to the origins of self-esteem, the subject did
receive attention in their works. James' analysis, as revealed
in Principles of Psychology (16), suggested several possible influences
upon self-esteem. In analyzing subjective experience and the signifi-
cance of the self, he concluded that human aspirations and values
had an essential role in determining whether people regard themselves
favourably. Achievements were measured against aspirations for any given area of behavior so that, if achievement approached or met aspirations in a valued area, the result was higher self-esteem. On the other hand, if there were wide divergences, then people regarded themselves poorly.

Essentially, James viewed self as the sum total of all that a person could call his, not only his body and his psychic process, but his clothes and house, his wife and children, his ancestors and friends, his reputation and works, his land and horses, and yacht and bank account. In addition to the material constituents of the self, he proposed a social self which is the recognition he gets from his peers; that is a man has as many social selves as there are people who recognize him and carry an image of him in their mind. The enhancement of a man's extended self, be it his body, race, father, or reputation, would be expected to raise self esteem, and derogation would be expected to have the opposite effect.

Mead's (17) contributions regarding this subject are an elaboration of what James called the social self. As a sociologist, Mead is concerned with the process by which the individual becomes a compatible and integrated member of his social group. In Mead's opinion, during the course of this process the individual internalizes the ideas and attitudes expressed by the key figures in his life. The individual does this by observing the actions and attitudes of others, adopting them (often unknowingly) and then expressing them as his own. This holds true for attitudes and actions
expressed toward himself as well as toward external objects. In effect, he comes to respond to himself and develops self-attitudes consistent with those expressed by the significant others in his world. Internalizing their posture toward him, he values himself as they regard and value him and demeans himself to the extent that they reject, ignore, or demean him.

It can be seen that Mead's formulation concluded that self-esteem is largely derived from the reflected appraisal of others; that is, the gauge of self evaluation is a mirror image of the criteria employed by the important persons of one's social world and as children these criteria are internalized; children observe how they are regarded, and value themselves accordingly. Mead (17) observed that no matter how isolated and independent a person may believe himself to be, he carries within himself the reflecting mirror of his social group. If he places high value on himself, then there have been key persons in his life who have treated him with concern and respect. If he holds himself lowly, however, significant others have treated him as an inferior object. In essence then, the views of the generalized (significant) others as expressed in their manner of treatment are Mead's key to the formulation of self-esteem.

A major contribution toward understanding self-esteem and its antecedents has been made by Rosenberg, a sociologist (20). Rosenberg's research represents a significant step in explaining many of the social conditions associated with enhanced and diminished self-esteem. Some of the Rosenberg's findings are herein included, but this list is by no means all inclusive. First, he found that social
class is only slightly related and ethnic group affiliation is not related to self-esteem; this finding helped considerably to clarify the norms that the individual employs in self-evaluation. It now appears that the broader social context does not play as important a role in interpreting one's own successes as has often been assumed. This is also underscored by Rosenberg's findings that the amount of paternal attention and concern, which differs by social class, religion, and ethnic group, is significantly related to self-esteem. For example, adolescents who had closer relationships with their fathers rated higher in self-esteem than did those with more distant, impersonal relationships. Rosenberg in moving from the more complex and global variable of social class to the specific correlations in the "effective interpersonal environment" that affect self-esteem has given an indication of those features of the environment that the child equates with "success".

There were two further important findings which related self-esteem to religion and to order of birth. In the case of religion, social prestige in the community at large had little influence on self-esteem. Jews, who were lower in the hierarchy of general social prestige in the study, were more apt to be higher in self-esteem than were either Catholics or Protestants. This finding was seen to be largely a function of the great amount of interest and attention that Jewish children, especially boys, receive from their parents. Within the family itself, only children, and particularly male children, were higher in self-esteem. These results from
Rosenberg's research provide us with a more concise knowledge of the conditions that lead children to interpret experiences as successes.

There are, of course, many other theories and concepts dealing with the subject of self-esteem, however. Coopersmith (13), felt that these investigations in a general sense led to the conclusion that there were four major factors contributing to the development of self-esteem. He stated first and foremost is the amount of respectful, accepting, and concerned treatment that an individual receives from the significant others in his life. In effect, people value themselves as they are valued, and this applies to extensions of oneself as well as the more centrally experienced aspects of self-image. A second factor contributing to self-esteem was the history of successes and the status and position held in the world. Successes generally bring recognition and are thereby related to status in the community. They form the basis in reality for self-esteem and are measured by the material manifestations of success and by indications of social approval. These indices of success and approval will not necessarily be interpreted equally favorable by all persons. The third factor contributing to self-esteem was that when an individual lives up to aspirations in areas that are regarded as personally significant the individual achieves high self-esteem. Thus experiences are interpreted and modified in accord with the individual's values and aspirations. Success and power and attention are not directly and immediately perceived but are filtered through and perceived in the light of personal goals and values. The fourth factor was the individual's manner
of responding to devaluation. Persons may minimize, distort, or entirely suppress demeaning actions by others as well as failures on their own part. The ability to defend self-esteem reduces the experience of anxiety and helps to maintain personal equilibrium. In studies of how the personality functions, this ability to maintain self-esteem in the face of negative appraisals has been described by such concepts as controls and defenses. These terms refer to the individual's capacity to define an event filled with negative implications and consequences in such a way that it does not detract from a sense of worthiness, ability, or power.

Coopersmith (13) commented that both common observation and theoretical rationales lead us to assume that popularity is positively associated with high self-esteem. The reasoning for this is as follows: popularity is a manifest indication of social success, and the level of success is presumably related to self-esteem; therefore, the more successful person may be expected to be higher in self-esteem. In terms of social success, persons who are accepted and sought after bask in the reflected favorable appraisals of others but those who are ignored or critically received suffer from ostracism. A number of factors may conceivably alter the relationship between popularity and esteem such as age, sex, or the criteria employed for judging success, but there is good reason to believe that a general relationship does indeed exist. This is particularly true in American society in which participation in social activities and popularity are highly valued and generally
desired goals in themselves.

Notwithstanding the above comments, Coopersmith (13) was quite surprised by his research findings which indicated that popularity was not associated with the subjective experience of esteem, even though it was related to more overt, behavioral indices of assurance. Presumably acceptance by one's peers was not sufficient or closely enough related to self-judgement; that it necessarily eventuated in favorable self-appraisal. This suggests that popularity with one's peers is more likely to be associated with a poised, confident, and forthright exterior than it is with favorable self-attitudes. There is no way, with our present level of expertise, of establishing the direction of the relationship; that is, whether greater poise and assurance results in greater popularity or whether it is popularity that leads to assurance. What can be indicated is that such a relationship exists and that popularity is associated with behavioral poise rather than subjective judgements of worthiness. Coopersmith's findings also indicated that whereas popularity was associated with overt expressions of confidence, the self-perceptions associated with friendship were likely to be associated with subjective perceptions of esteem. Persons who perceived themselves as having difficulties in social situations were likely to evaluate themselves poorly, no matter how poised they appeared in their overt behaviors. In effect, it is the person's perception of his social success rather than peer appraisal of his competence and success that determines how well an individual regards himself. The data from Coopersmith's study
also indicated that the difference between the various levels of esteem were significant, thereby indicating that persons with high self-esteem were able and willing to publicly express and support their opinions. These persons resisted strongly any pressure to make them respond along lines that were contrary to their own perceptions and judgments, and followed their own opinions even where these were markedly different from those that were popularly accepted.

Coopersmith (13) stated that the importance of self-esteem for creative expression appears to be almost beyond disproof. That is, without a high regard for himself the individual who is working in the frontiers of his field cannot trust himself to discriminate between the trivial and the significant. Also without trust in his own powers, the person seeking improved solutions or alternative theories has no basis for distinguishing the significant and profound innovation from one that is merely different. Essentially then trust in self is also expressed in the individual's confidence that he can venture into new areas without fear of losing his direction or respectability, particularly since these are largely determined by personal criteria and judgments.

It has been stated (66) current vocational choice theory postulates that the choosing of a certain set of social roles, such as involved in vocational choice and the rejecting of others, is dependent on the characteristics which one attributes to oneself on either a conscious or unconscious level, and the characteristics which are attributed to performance in the various social roles. The choice is then made on the basis of the extent to which an individual
sees himself in the role or the role as befitting himself. The assumption is made that all other things being equal, individuals will engage in those behavioral roles which will maximize their sense of cognitive balance or consistency.

The results of Korman's (66) investigation supported quite strongly the prediction that self-esteem as defined previously by Gelfand (55) operated as a moderator variable in the process of vocational choice. Those who were high on this variable used their self-perceived needs differently from those who thought relatively poorly of themselves. For those high in self-esteem, their self-perceived needs were those that had been satisfied in the past and it was therefore appropriate and consistent for the individual to seek out those roles where they would be satisfied in the future. On the other hand, for individuals low in self-esteem, such motivation may appear not to exist. His self-perceived needs have not been satisfied in the past and he has more likely become both more familiar with non-need-satisfying situations and being more accepting of them. To put it in the previous framework, such situations are more consistent for him than for the high self-esteem individual.

In essence, then, these results seem to support in a realistic, highly important life-choice situation, the findings of a number of laboratory investigations that individuals of low self-esteem are more likely to seek less reward for a similar task than individuals of high self-esteem (18), and to rate information which confirms their low self-esteem more favorably than information which tells them they
are better than their low-esteem of themselves tells them they are.

An area of research that is of particular interest to the work being proposed in this study deals with investigations that have been conducted to determine if attitude toward or interest in mathematics is related to general personality variables (92). In these investigations it was found that attitude toward mathematics is significantly related to leadership potential in the male and to adjustment to reality in the female. Those making higher scores on these personality variables had a more favorable attitude toward mathematics. The results of an investigation along similar lines (49) suggested that higher scorers on the attitude scale, with mathematical ability statistically controlled, tended to be more socially and intellectually mature, more self-controlled, and place more value on theoretical matters than did low scorers on the scale. These findings seem to suggest that attitude toward mathematics is related to a broad constellation of personality variables indicative of adjustment and interest.

A unique formulation of self-concept has been developed by Kinch (65). In his formulation Kinch has attempted to develop a model of self-concept that is more formal and systematic so that it could be considered an improvement over the general run of theories in sociology. The definition of self-concept used in this model is as follows (65, p. 481): "Self-concept is the organization of qualities that the individual attributes to himself".

It is to be understood that the word "qualities" is used in a
broad sense to include both "attributes" that the individual might express in terms of adjectives (ambitious, intelligent, etc.) and also the "roles" he sees himself in (father, doctor, etc.).

The general theory of Kinch (65, p. 481), can be stated in one sentence: "The individual's conception of himself emerges from social interaction and, in turn, guides or influences the behavior of that individual." Therefore, in light of the above statement, the basic postulates of the formalized theory are as follows:

Proposition I. The individual's self-concept is based on his perception of the way others are responding to him.

Proposition II. The individual's self-concept functions to direct his behavior.

Proposition III. The individual's perception of the responses of others toward him reflects the actual responses of others toward him (65, p. 482).

Admittedly, these postulates are not expected to hold under all conditions. However, the formalization procedure herein described allows one to consider the conditions under which they will hold.

Initially the above three statements make up the postulates of the theory. There are four basic concepts or variables involved and they are as follows:

1. The individual's self-concept (S).

2. His perception of the responses of others toward him (P).

(The response of the individual to those behaviors of others that he perceives as directed toward him).
3. The actual responses of others toward him (A). (The actual behavior of the others, that is, in response to the individual).

4. His behavior (B). (The activity of the individual relevant to the social situation).

Now by the use of simple logic we may take the three basic propositions (I, II, III) and deduce from them three more. For example, from postulates I and II we can conclude that the way an individual perceives the response of others toward him will influence his behavior, for if his perception determines his self-concept and his self-concept guides his behavior, then his perception will determine his behavior. We can put this in symbolic form as follows:

\[
\begin{align*}
\text{if } P & \Rightarrow S \text{ postulate I} \\
\text{and } S & \Rightarrow B \text{ postulate II} \\
\text{then } P & \Rightarrow B \text{ postulate IV}
\end{align*}
\]

In effect, the fourth proposition of the theory (you can call it a derived proposition) is:

Proposition IV. The way the individual perceives the responses of others toward him will influence his behavior.

I and II deduce a fifth proposition in the same manner.

Proposition V. The actual responses of others to the individual will determine the way he sees himself (his self-concept).

By combining either propositions II and V. or III and IV a sixth proposition can be derived:
Proposition VI. The actual responses of others toward the individual will effect the behavior of the individual.

In summary form, to this point, the theory can be stated as follows: The actual responses of others to the individual will be important in determining how the individual will perceive himself; this perception will influence his self-conception which, in turn, will guide his behavior. Symbolically we have:

$$A \rightarrow P \rightarrow S \rightarrow B \rightarrow$$ = "leads to" a new postulate. The seventh proposition is:

Proposition VII. The behavior that the individual manifests influences the actual responses of others toward that individual.

Notice that new variables are not being dealt with but rather with a new combination of the old ones. As can be seen, the theory at this point becomes circular. Expressed symbolically it is as follows:

As might be expected with the addition of this new postulate, a whole new set of derived propositions emerge. It would be very laborious to list all of these propositions. Therefore, as an example, consider now some of the factors which modify one of the propositions. It seems clear that as the theory now stands it has not gone far enough in explaining the phenomena under consideration. Of course, this might prove misleading if left as it is. In essence, the major
problem lies in the fact that the propositions are presented as if there was a one-to-one relationship among the variables being dealt with. When in fact a number of extraneous variables could influence the outcome of the propositions. It is quite apparent that in reality these propositions hold true only in varying degrees under certain conditions. To illustrate the type of thing that might be done briefly consider the conditions under which one would expect proposition III to hold.

Postulate III states that the individual's perception of the responses of others toward him reflects the actual responses of others. There is ample evidence relating to the accuracy of this postulate. Studies of role-taking ability have, almost without exception, operationally defined role-taking ability in terms of the relationship between the individual's perception of the responses of others and the actual responses.

Kinch (65, p. 483) felt the evidence seemed to suggest that the accuracy of postulate III varies with 1) the individual's familiarity with others, 2) his familiarity with the situation, 3) the social visibility of the situation, 4) the individual's past experience in interpersonal situations, and 5) other factors which relate to all types of perception (condition of body, immediate past, etc). Essentially then, proposition III says that the more familiar the individual is with the situation and the others in the situation, the more experience the individual has had in interpersonal situations and the less interference there is from irrelevant conditions, the
more likely it is that postulate III will hold.

Kinch (65, p. 484) listed the advantages and disadvantages of this approach over the informal, unsystematic approaches usually used in sociology. The advantages seen in this approach are listed below (no rank order is implied):

1. The formalized theory offers the most parsimonious summary of anticipated or actual research findings.
2. The formalized theory will make the present knowledge on the subject cumulative and point to gaps if they exist.
3. The formalized theory requires a clear distinction between statements that define the concepts of the theory and statements that are empirical propositions.
4. The formalized theory allows for careful consideration of the conditions under which the theory is expected to hold.
5. The formalized theory provides a systematic procedure for scrutinizing the theory in terms of hidden implications and conceptual problems.
6. The formalized theory enables the investigator to bridge gaps in his data.
7. The formalized theory facilitates communication.

The one disadvantage to this approach is that the formalized theory must not be treated as a set of logically and conceptually tight statements complete within themselves. It should be clear that the formal statements of the theory must be limited by statements of conditions. We should temper our statements even more with some "common sense"
notions we have about the subject with which we are concerned.

There have been a number of other studies dealing with this subject; self-esteem and/or self-concept and the ones presented here are by no means all inclusive. The choice among the alternatives was made for this study, however, along common-sense lines as suggested by Coopersmith (13), (51, p. 4), that is, if you want to know how a person evaluates himself, ask him. Others have used this approach with some success, the work of Rosenberg (20) being an example.

In essence, Coopersmith's (13), list of questions developed for the study of pre-adolescents was modified by Bennett (51), for use with adult males. Of the 58 items presented, 20 appeared to be related to activities of childhood or adolescence. These 20 items were rewritten with a more adult connotation, and the modified scale was administered to a sample of newly admitted inmates. Item analysis was used and the eight items with the lowest correlation with the total score were eliminated, resulting in a fifty item inventory.

The only factor used for selection of an inmate for the study to validate the SEI (modified) was that the inmate be able to read at a sixth grade level or above. The subjects were tested in groups of thirty to fifty as a part of the regular testing program administered to the weekly intake of inmates to the California correctional system.

In analyzing the data, correlation coefficients were computed to determine reliability by Bennett (51). It was found that all measures of reliability were within acceptable limits, with all correlation coefficients significant at beyond the .01 level (Table I).
TABLE I

Various Reliability Estimates of the Self-Esteem Inventory

<table>
<thead>
<tr>
<th>Reliability Measure</th>
<th>N</th>
<th>r1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odd-even</td>
<td>95</td>
<td>.80</td>
</tr>
<tr>
<td>One week interval</td>
<td>76</td>
<td>.77</td>
</tr>
<tr>
<td>Two week interval</td>
<td>66</td>
<td>.80</td>
</tr>
<tr>
<td>Five week interval</td>
<td>100</td>
<td>.60</td>
</tr>
</tbody>
</table>

The investigators of the above study, in a separate sample of seventy inmates, found that the correlation over a five week interval was .78, suggesting that groups differ as to rate of change in the prison setting. However, these levels of reliability (around .80) were consistent with those reported by other investigators. Bennett, et. al., from the results obtained, concluded that the SEI (modified) can be applied in a correctional setting.

A number of studies regarding mathematics relative to its relationship to males have been reported in the literature. However, most of them seem to feel that the relationship between males and mathematical ability primarily is one of a community and parental expectation. Regardless of the reasons for its existence, the relationship between males and mathematical ability does seem to exist and thus is an appropriate area of educational research.

1All r's significant beyond .01 level

CHAPTER III
RESEARCH DESIGN

The experimental design method was used to analyze the effect of a mathematical educational model on self-esteem of male prison inmates. It is a classical type of design used "by scientists because it maximizes the probability that one will learn about influences on the variables under study" (15, p. 106). This assumes that extraneous variables are controlled.

The simplest example of this type of design designates one variable as the experimental, or independent variable. The purpose of this kind of design is to determine the influence of this designated experimental variable on some specified dependent variable. To maximize the probability that changes in the dependent variable are due to the experimental variable and to nothing else, the researcher attempts to hold constant all other possible influences on the dependent variable. The researcher should have certain standards for his research design, consequently, he attempts to control extraneous influences on variables and to maximize exposure to the experimental variable.

There are four variations of the classic experimental design, all based on John Stuart Mill's "Canons" (12). These "Canons" may be described briefly as the method of agreement, the method of difference,
the method of concomitant variation, and the method of residues.

The four methods may be summarized as follows:

1. An independent variable cannot be considered an influence on a dependent variable if it is present in an experiment during which no change takes place in the dependent variable.

2. An independent variable cannot be considered an influence on a dependent variable if it is absent in an experiment during which a change takes place in the dependent variable.

3. An independent variable cannot be considered an influence on a dependent variable if it varies in some manner but the dependent variable does not vary in some concomitant manner.

4. If all variation in a dependent variable known to be associated with certain independent variables is removed, then any remaining variation in the dependent variable must be influenced by the independent variable which remains.

In keeping with the above facts then any study to determine the effectiveness of the experimental or independent variable must follow the standards set forth above for an experimental designed research project (Table II).
TABLE II
Experimental Design

<table>
<thead>
<tr>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E</strong> : 0₁</td>
<td>TR</td>
</tr>
<tr>
<td><strong>C</strong> : 0₃</td>
<td></td>
</tr>
</tbody>
</table>

E = Experimental Group
C = Control Group
TR = Treatment: tutoring program
O = Observation: Scores on Multi-Dimensional SEI (modified) Scale.

1. Main dependent variable is post-test scores (0₂, 0₄) and gain scores (0₂ - 0₁, 0₄ - 0₃).
2. Main independent variable is the treatment modality TR.
3. Objective is to determine if there is a statistical significant difference between E group and C group in post-test levels of self-esteem, controlling for all relevant intervening variables:
   Age
   IQ
   Education
   Skill Trade
   Family Income
Hypotheses

The primary objective of this study was to determine the effect of a mathematical education model on self-esteem of male prison inmates. To achieve this objective, a number of null hypotheses were stipulated.

Major Hypotheses

Null Hypothesis No. 1: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects.*

Null Hypothesis No. 2: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects.

Sub-Hypotheses

Null Hypothesis No. 1: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for race.

Null Hypothesis No. 2: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between White subjects and Black subjects.

Null Hypothesis No. 3: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-race.

*The gain score values can be in a positive or negative direction.
Null Hypothesis No. 4: There is no difference in Mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for race.

Null Hypothesis No. 5: There is no difference in mathematical (Math) adjusted mean gain scores between White subjects and Black subjects.

Null Hypothesis No. 6: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-race.

Null Hypothesis No. 7: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for residential status.

Null Hypothesis No. 8: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between rural subjects and urban subjects.

Null Hypothesis No. 9: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-residential status.

Null Hypothesis No. 10: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for residential status.
Null Hypothesis No. 11: There is no difference in mathematical (Math) adjusted mean gain scores between rural subjects and urban subjects.

Null Hypothesis No. 12: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-residential status.

Null Hypothesis No. 13: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects controlling for religious status.

Null Hypothesis No. 14: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between Roman Catholic subjects and Protestant subjects.

Null Hypothesis No. 15: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-religious status.

Null Hypothesis No. 16: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for religious status.

Null Hypothesis No. 17: There is no difference in mathematical (Math) adjusted mean gain scores between Roman Catholic subjects and Protestant subjects.
Null Hypothesis No. 18: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-religious status.

Null Hypothesis No. 19: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for age.

Null Hypothesis No. 20: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for age.

Null Hypothesis No. 21: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for IQ.

Null Hypothesis No. 22: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for IQ.

Sub-Hypotheses for Experimental Group

Null Hypothesis No. 1: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the IQ mean scores of the subjects for the experimental group.

Null Hypothesis No. 1A: It is expected that as the experimental group subject's IQ means go up that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the experimental group subjects.
Null Hypothesis No. 2: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the pre-experimental reading level mean scores of the subjects for the experimental group.

Null Hypothesis No. 2A: It is expected that as the experimental group subject's pre-experimental reading level mean scores go up that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the experimental group subjects.

Null Hypothesis No. 3: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the age means of the subjects for the experimental group.

Null Hypothesis No. 3A: It is expected that as the experimental group subject's age means go up that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the experimental group subjects.

Null Hypothesis No. 4: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the educational level means of the subjects for the experimental group.

Null Hypothesis No. 4A: It is expected that as the experimental group subject's educational level means go up that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the experimental group subjects.

Null Hypothesis No. 5: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the race of the subjects for the experimental group.
Null Hypothesis No. 5A: It is expected that regardless of the race of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental group.

Null Hypothesis No. 6: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the type of crime committed by the subjects for the experimental group.

Null Hypothesis No. 6A: It is expected that regardless of the type of crime committed by the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental group.

Null Hypothesis No. 7: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the residential status of the subjects for the experimental group.

Null Hypothesis No. 7A: It is expected that regardless of the residential status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental group.

Null Hypothesis No. 8: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the marital status of the subjects for the experimental group.

Null Hypothesis No. 8A: It is expected that regardless of the marital status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental group.
Null Hypothesis No. 9: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the occupational status of the subjects for the experimental group.

Null Hypothesis No. 9A: It is expected that regardless of the occupational status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of subjects in the experimental group.

Null Hypothesis No. 10: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the perception of family income level of the subjects for the experimental group.

Null Hypothesis No. 10A: It is expected that regardless of the perception of family income level of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental group.

Null Hypothesis No. 11: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain scores and the religious status of the subjects for the experimental group.

Null Hypothesis No. 11A: It is expected that regardless of the religious status of the experimental groups subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects in the experimental groups.

Null Hypothesis No. 12: There is no significant relationship between the self esteem inventory (S.E.I.) mean gain scores and who
reared the subjects for the experimental group.

**Null Hypothesis No. 12A:** It is expected that regardless of who reared the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain scores of the subjects for the experimental group.

**Sampling**

The sample populations for this research project were drawn from two sources. One (experimental group) was drawn from the inmate population at the Louisiana State Police Headquarters in Baton Rouge, Louisiana and the other (control group) was drawn from the inmate population at Jackson Barracks in New Orleans, Louisiana.

At midpoint of the research project seventeen of the original forty inmates (experimental group) had been transferred to another correctional facility. The seventeen inmates were replaced and the research project continued with a total of forty inmates in its experimental group. The seventeen inmates who left the project were given the same post-test as those inmates who completed the project. The original forty inmates (control group) at Jackson Barracks remained in the research project for the entire period of the research project. Both the State Police Headquarters' unit and the unit at Jackson Barracks contained approximately 120 inmates.

In order to be selected to participate in the project, the inmate was required to meet two basic criteria. First, he would have to be within twelve months of discharge or within twelve months
of qualifying for the state penitentiary's work release program (all of the inmates met this criteria). Secondly, he would have to have an IQ of eighty and be able to read at the first grade level. Some inmates were included in the project who had less than a tested eighty IQ if their supervisor felt their daily work record indicated their IQ was equivalent to those inmates with a tested IQ of eighty.

**Data Collection**

The units of observation were the Adston Mathematical diagnostic instrument, (24), (Appendix B), a standard reading test, (25), (Appendix A), and a socio-economic profile of the inmates (Appendix D).¹

The reliability of the Adston mathematical diagnostic instrument has been established in a number of parish school systems in Louisiana. Adams reports that:

The internal consistency, or reliability of each diagnostic instrument on operations in the series has been computed in terms of a coefficient of reliability. The Kuder-Richardson Formula 20 was used in these computations. The coefficients thus computed were:

- Addition Diagnostic, \( r = .88 \)
- Subtraction Diagnostic, \( r = .92 \)
- Multiplication Diagnostic I, \( r = .93 \)
- Division Diagnostic I, \( r = .94 \)
- Division Diagnostic II, \( r = .92 \) (24, p. 4)

¹The standard reading test utilized was developed by Drs. Sam Adams and Frederick Smith and was published in 1975 by Adston Educational Enterprises, Inc., Baton Rouge, Louisiana.
The reliability of the Adston reading test has also been established in a number of parish school systems in Louisiana. Adams and Smith report that:

The internal consistency, or reliability of each diagnostic instrument on operations in the series has been computed in terms of a coefficient of reliability. The Kuder-Richardson Formula 21 was used in these computations. The coefficients thus computed were:

(Average of all possible split halves)
-6 Reading Level Test, \( r = .943 \)
+6 Reading Level Test, \( r = .913 \)
Overall, \( r = .944 \) (25, p.4)

The Self Esteem Inventory (modified) has a reliability correlation coefficient of approximately .80.

The socio-economic profile was utilized in a previously cited study (45).

The method of data collection utilized was a pre-test and a post-test utilizing the following instruments:

1. Adston Mathematical Diagnostic Instrument
2. A Standard Reading Test
3. The Self-Esteem Inventory (modified)
4. A Pre-Test Socio-Economic Profile

The inmates selected for the study were given a pre-test consisting of the above three tests. After the pre-test the inmates were tutored individually by specially trained tutors for eighteen weeks. The tutoring lessons were based upon the diagnosis of each inmate's mathematical test, and a special mathematics curriculum for each inmate was designed for him based on the results of the mathematical analysis of his mathematics test. Each of the eight tutors
tutored five inmates for forty-five minutes twice a week for eighteen weeks. At the end of the tutoring sessions, the inmates were given a post-test consisting of the same instruments utilized in the pre-test.

There was a control group of inmates for this project as previously mentioned. These inmates were housed at Jackson's Barracks in New Orleans, Louisiana. Approximately forty inmates from the above facility were utilized in the project. They were given the same pre-test and post-test that the inmates in the experimental group were given. There was a socio-economic profile developed on all participating inmates. The control group inmates were not given the special tutoring sessions given the experimental group. This sample of inmates did meet the same criteria in order to participate in the study as the inmates in the experimental group.

The variables to be measured were the mathematical scores, the reading scores, and the self-esteem scores achieved by the inmates in their pre and post-testing. The researcher measured the differences, if any, among these three areas and then determined what relationships existed between and/or among the variables.

Interviewer bias was controlled by utilizing professional interviewers for pre and post-testing and by the use of professional tutors for the treatment. Some held the doctorate, while the remainder held master's degrees.

Population bias was controlled by selecting and matching the experimental and control groups from incarcerated persons. That
is, the subjects were randomly selected from each facility's (State Police and Jackson Barracks) populations and then assigned to either the experimental group or the control group. All of the experimental group subjects were randomly selected from the State Police facility's population and all of the control group subjects were randomly selected from the Jackson Barracks facility's population.

The experimental and control group subjects were matched with respect to length of time remaining to be served (a minimum of six months and a maximum of twelve months), a minimum IQ of 80, sex, and race distribution of the penal institutions (approximately 70 per cent Black and 30 per cent White).

**Analyses**

The classical pre-test post-test control group design was used in this study to test the effect of a mathematics tutoring program on inmate's self-esteem.

The objective of the statistical analysis was to determine if a statistically significant difference in mean self-esteem scores between treatment and control groups was obtained as a result of the experiment.

As specified above, the general hypothesis of this study was that the experimental group would manifest a substantial increase in self-esteem as a result of the prescribed treatment effect-controlling for relevant intervening variables (i.e., IQ, age, etc.).
Operationalization of dependent and independent variables was as follows:

1. The main dependent variable, self-esteem was scaled to meet the minimum measurement required of the analysis of variance statistical model. Precedent for assuming this level of measurement can be found in Bennet's work with this variable (50). In the final analysis, self-esteem gain scores were used to statistically test the null hypothesis of no difference between groups. Gain-scores were calculated for each subject in both groups by subtracting individual pre-test self-esteem scores from post-test self-esteem scores and this constitutes the main dependent variable in the analysis that follows.

2. The main independent variable in this study, of course, is group type. Each subject was randomly assigned to either the experimental group or the control group, and is treated here as a dichotomized nominal level variable. Independent intervening variables such as actual age, age at first commitment, IQ, were treated as interval level variables in the analysis of variance.

Other independent variables such as race, religion, and type of crime were operationalized at the nominal level of measurement and treated as such in the statistical analysis.
The statistical analysis consisted of several stages. Data was computer processed using Statistical Analysis System (SAS) programs (46).

1. Preliminary calculations were performed to establish comparability of the two groups in terms of social background characteristics. Means, standard deviations, and frequency distributions were used for the above purpose.

2. Next, a difference-of-means statistical analysis was performed to test the null hypothesis of no difference in self-esteem gain-scores between groups. The statistical model indicated for this analysis is conventional one-way analysis of variance technique, given a dependent variable measured at the interval level and an independent variable measured at the nominal level (group type). The same test was used to measure the difference of means between groups on math gain-scores. At this stage no statistical controls for hypothesized intervening variables were established.

3. The final analysis consisted of multivariate analysis of variance with controls. This stage of analysis involved the testing between group difference in self-esteem while statistically controlling for a set of hypothesized intervening effects, such as, race, IQ, age, etc. This
technique, an extension of the conventional one-way analysis of variance, allows one to determine the significance and strength of a collection of several independent variables measured both at the interval level and nominal level (46, p. 115).

In adhering to acceptable standards for conducting research the .05 level of significance was established for the statistical test performed. However, any statistical results above the .25 level of significance will be reported. This is felt to be justified because of the exploratory nature of the research.
CHAPTER IV
ANALYSIS OF DATA

This study was designed to determine the effect of a mathematical education model on self-esteem of male prison inmates. If the study should demonstrate that the mathematical education model had a positive effect on the self-esteem of male prison inmates, the model could then be utilized as a basic component of most general rehabilitative programs presently in operation throughout the criminal justice system.

Data used in this study was collected from a sample of 40 male prison inmates drawn from the inmate population quartered at the Louisiana State Police Headquarters compound in Baton Rouge, Louisiana. The data collected for 18 of these inmates was incomplete and therefore the data presented reflects a total of 22 inmates in the experimental group. There also was a control group of male prison inmates utilized in this study. This control group consisted of 40 inmates. Again, however, the data collected on nine of these inmates was incomplete and the data presented reflects a total of 31 inmates in the control group.

Each group, the experimental and the control, was administered pre and post-tests. The pre-tests were composed of a self-esteem inventory test, a mathematics test and a reading rest. The post-tests
consisted of the same three tests. The difference between the pre-
test and the post-test on the self-esteem inventory (S.E.I.) test
or (SEI gain scores) was the dependent variable in the study. The
basic independent variable in the study was the individualized
tutoring in mathematics given to the inmates in the experimental
group. Specific null hypotheses were established for testing
differences in self-esteem in male prison inmates in the experimental
and control groups, according to selected socio-economic character-
istics. The results of the statistical analyses of the several
relationships are presented for each hypothesis.

A comparison of the inmates in the control group is presented
in Table III. Selected variables were used to compare the exper-
imental and control groups.
<table>
<thead>
<tr>
<th>Selected Variables</th>
<th>Experimental Group</th>
<th></th>
<th>Control Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Range Low-High</td>
</tr>
<tr>
<td>Age at present Commitment</td>
<td>22 26.8</td>
<td>6.6</td>
<td>18 to 43</td>
<td>31</td>
</tr>
<tr>
<td>Age</td>
<td>16 31.0</td>
<td>7.5</td>
<td>21 to 46</td>
<td>20</td>
</tr>
<tr>
<td>Years of Education</td>
<td>22 8.8</td>
<td>3.5</td>
<td>2 to 15</td>
<td>31</td>
</tr>
<tr>
<td>Age at First Commitment</td>
<td>22 26.7</td>
<td>7.9</td>
<td>12 to 43</td>
<td>31</td>
</tr>
<tr>
<td>Longest Single Time Free Since First Commitment in Years</td>
<td>22 21.1</td>
<td>1.9</td>
<td>1 to 6</td>
<td>31</td>
</tr>
<tr>
<td>IQ</td>
<td>21 89.6</td>
<td>21.4</td>
<td>60 to 133</td>
<td>29</td>
</tr>
</tbody>
</table>
From the data in Table III it can be seen that the two groups were very much alike. In fact, if the mean of each of the six variables is rounded off, none of the variables for the two groups are separated by more than one unit from the other, and in many cases less than a unit difference existed. Such variables as actual age, years of education, and IQ are good indicators upon which to compare the two groups. It is generally agreed that persons of the same age group, other things being equal, have a lot in common. It is more likely that members of a similar age group have had about the same exposure to a number of the environmental stimuli such as prevailing values and sentiments expressed in the media, the economic climate of the day, changing sexual mores, etc. The IQ of a person, of course, is generally an indication of that person's ability to succeed in the academic sphere but does not preclude success in other areas as well. In fact, as a person's IQ goes up there are generally more alternative areas open to him and a greater likelihood that he or she will succeed in one or more of these areas.

The years of education a person has undergone tells a great deal about him. For example, whether a person has the ability to master certain types of jobs, his potential for management, whether he can see a job through to completion, etc. Of course, there are exceptions to the above generalities; however, it can be accepted as a given fact that education is a very good form of self-discipline, self-discipline being a quality that members of these two groups by and large do not possess.
Age at present commitment, age at first commitment, and the longest single time free since first commitment are three variables that reflect a marked similarity between these two groups.

The racial composition of groups involved in any study is important when one attempts to study any facet of prison life. Table IV presents data that illustrates the racial composition of the inmates in the experimental and control groups.

**TABLE IV**

A COMPARISON OF THE RACIAL DISTRIBUTION OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th></th>
<th>Control Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>White</td>
<td>8</td>
<td>36.4</td>
<td>5</td>
<td>16.1</td>
</tr>
<tr>
<td>Black</td>
<td>14</td>
<td>63.6</td>
<td>26</td>
<td>83.9</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
<td>31</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The inmates in the experimental group more nearly approximated the racial composition of the prison population in Louisiana than did the inmates in the control group. The racial composition at the Louisiana State Prison in Angola in 1974 was as follows: Black 67 per cent; White 33 per cent (46, p.63). Even though the racial composition of the inmates in the control group was skewed in the direction of a heavier Black representation it was felt that this imbalance caused no serious problems in the study.
The geographic environment one comes from definitely plays a part in how one views and responds to the world around him. Most people accept as true the following general descriptions of an urbanite and ruralite. An urbanite is more cosmopolitan, better educated, earns a higher income, is more flexible in his moral outlook on life, is younger, and is more liberal politically than is his rural counterpart (19). Table V depicts the rural-urban distribution of the inmates in the experimental and control groups.

TABLE V
A COMPARISON OF THE RURAL-URBAN STATUS OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Rural Urban</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Rural</td>
<td>10</td>
<td>45.5</td>
</tr>
<tr>
<td>Urban</td>
<td>12</td>
<td>54.5</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As with the racial composition of these two groups, the composition of the inmates in the control group was skewed, with more being concentrated in the urban end of the rural-urban continuum. However, here again it is felt that this imbalance in rural-urban composition did not present a serious problem, primarily because the skewness was not pronounced.
The data presented in Table VI illustrates the religious distribution within the experimental and control groups.

TABLE VI
A COMPARISON OF THE RELIGIOUS DENOMINATION OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Religious Denomination</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Roman Catholics</td>
<td>6</td>
<td>27.3</td>
</tr>
<tr>
<td>Protestant</td>
<td>16</td>
<td>72.7</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

This is a unique distribution in that there was only one Protestant denomination (Baptist) contained within both groups. The religious distribution of the two groups, however, is approximately the same. It might appear that the religious distribution is skewed since when one considers that the racial distribution within the two groups is very similar to the religious distribution occurring within the larger society, the explanation for this occurrence seems apparent; that is, the great majority of the Blacks in Louisiana and in the South in general belong to a Protestant denomination, and Baptists tend to predominate.

Table VII presents the marital status of the inmates within the experimental and control groups.
TABLE VII

A COMPARISON OF THE MARITAL STATUS OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Married</td>
<td>9</td>
<td>40.9</td>
</tr>
<tr>
<td>Single</td>
<td>7</td>
<td>31.8</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Consort Non-Legal Union</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>22</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Approximately the same number of inmates in the experimental group and the control group were single, but here the similarity ends as far as the marital status of the two groups was concerned. Two striking differences may be noted. First the number of inmates in the experimental group who were included in the married status category comprised 40 per cent of that group, while the number of inmates in the control group included in the married status category comprised only 23 per cent of that group. Secondly, the number of inmates in the experimental group who were widowed comprised only 5 per cent of that group, while the number of inmates in the control group who were included in the widowed status category comprised 13 per cent of that group. The number of inmates
in the control group who were divorced and in the consort non-legal union status category comprised equal components (16 per cent), while the number of inmates in the experimental group who were included in the same categories were also equally represented (5 per cent in each category). The proportions in the separated status category for inmates in both the experimental and control groups were approximately the same (5 per cent and 3 per cent, respectively).

The number of children of the inmates in the experimental and the control groups is shown in Table VIII.

**TABLE VIII**

A COMPARISON OF THE NUMBER OF CHILDREN (OFFSPRING) OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Number of Children</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Zero</td>
<td>10</td>
<td>45.5</td>
</tr>
<tr>
<td>One</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>Two</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>Three or More</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The inmates in the control group had slightly more children per inmate (1.2 per inmate) than did the inmates in the experimental group (1.0 per inmate). This fact was further reflected when a comparison was made of the number of inmates who had no children; that is, 45 per cent of the inmates in the experiment group had
no children, compared with 32 per cent of the inmates in the control group.

Who reared the inmates in the experimental and the control groups is set forth in Table IX.

TABLE IX

A COMPARISON OF THE SOURCE OF REARING OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Source of Rearing of the Inmate</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Natural Parents</td>
<td>10</td>
<td>45.5</td>
</tr>
<tr>
<td>Mother</td>
<td>7</td>
<td>31.8</td>
</tr>
<tr>
<td>Father</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Mother and Step-Father</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Father and Step-Mother</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Relative</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>Non-Relative</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>22</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

More inmates in the control group were reared by their natural parents (58 per cent) than were the inmates in the experimental group (45 per cent); however, when only the mother reared the inmate, the reverse was true. In the experimental group 32 per cent of the inmates were reared by their mothers, while only 16 per cent
of the inmates in the control group were in the same circumstance. Table X presents the occupational distribution of the experimental and the control groups.

TABLE X

A COMPARISON OF THE OCCUPATIONAL STATUS OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Occupational Status</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Professional</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Skilled</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>Semi-Skilled</td>
<td>4</td>
<td>18.2</td>
</tr>
<tr>
<td>Unskilled</td>
<td>12</td>
<td>54.5</td>
</tr>
<tr>
<td>Clerical</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

First it should be noted that over three-fourths (77 per cent) of the inmates in the control group were unskilled workers compared with 55 per cent of the inmates in the experimental group. A most interesting fact about the inmates in both the experimental and control groups was that none had a clerical occupation. There was a larger number of inmates in the experimental group with skilled (23 per cent) and the semi-skilled (18 per cent) occupations as compared with their counterparts in the control group. Only 6 per cent of the inmates in the control group had a skilled occupation, and the same was true for those inmates in the semi-skilled occupation category (6 per cent).
It is commonly assumed that the level of income a person earns has a direct bearing on a person becoming involved in illegal activities. To a degree this assumption seems to be borne out by national statistical records maintained by the various agencies of the criminal justice system(36). There is an over-representation of lower income people in prison populations. Table XI presents a comparison of the inmates perception of family income for the experimental and control groups with respect to the adequacy of family income.

TABLE XI
A COMPARISON OF THE PERCEPTION OF FAMILY INCOME OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Perception of Family Income</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>Adequate</td>
<td>10</td>
<td>45.5</td>
</tr>
<tr>
<td>Marginal</td>
<td>9</td>
<td>40.9</td>
</tr>
<tr>
<td>Inadequate</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The inmates in the experimental group differed from the inmates in the control group in the degree that they perceived their family income as being adequate (45 per cent as opposed to 65 per cent for the experimental and control groups, respectively). The experimental group inmates who viewed their family income as being marginal was also different from that of the inmates in the control group (41 per cent as opposed to 16 per cent for the two groups, respectively).
It would be expected a priori that there would be a larger percentage of inmates who would perceive their family income as being inadequate and thereby justify or partially justify their criminal behavior. However, this was not the case with the inmates in this study. In fact, a relatively low percentage of these inmates perceived their family income as being inadequate (14 per cent as compared with 19 per cent for the experimental and control groups, respectively).

Throughout the criminal justice system it has been well established that the excessive use of alcohol is a prime factor in the commission of a wide range of crimes (46, p. 10). Table XII presents the distribution of the inmates in this study who admitted to using alcohol. This is not to say that everyone who admitted to the use of alcohol committed an alcohol related crime. Rather the data merely attempts to describe the extent of alcohol usage within the inmate population.

TABLE XII

A COMPARISON OF THE ALCOHOL USAGE HISTORY OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Alcohol Usage</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>No Usage</td>
<td>9</td>
<td>40.9</td>
</tr>
<tr>
<td>Usage</td>
<td>13</td>
<td>59.1</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The distribution of alcohol usage within both the experimental (59 per cent) and control (65 per cent) groups was approximately
the same. This distribution was comparable to the usage of alcohol in the outside world. Approximately 62 per cent of the adult population admitted to some alcohol usage (79, p. 2).

Another form of self abuse is non-medical drug usage. Table XIII depicts the distribution of drug usage within the inmates in the experimental and control groups.

TABLE XIII

A COMPARISON OF THE DRUG USAGE HISTORY OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Drug Usage History</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>No Usage</td>
<td>7</td>
<td>31.8</td>
</tr>
<tr>
<td>Usage</td>
<td>15</td>
<td>68.2</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The large increase of persons incarcerated for the illegal use of drugs is a relatively recent phenomena in the United States. It was in the 1960's that the illegal use of drugs began to accelerate in this country. One can hardly read a newspaper or magazine without seeing at least one article that deals with the increase illegal use of drugs.

The inmates in this study reflected the trend that the entire nation was experiencing relative to the illegal use of drugs. The number of inmates who either admitted to the illegal use of drugs or had been convicted of a drug related crime equalled the number of inmates who admitted to the use of alcohol. This is a very complex problem in that the illegal use of drugs, in itself a crime, leads to
the commission of a wide range of other crimes in order to support the habit of illegal drug usage.

There was an equal percentage of inmates in both the experimental and the control groups who had a drug related problem (68 per cent for each group).

In any inmate population there are persons who have committed crimes classified as less serious. Table XIV presents data on the extent to which inmates in the experimental and the control groups committed less serious crimes.

**TABLE XIV**

A COMPARISON OF THE FELONY CATEGORY ENTITLED "OTHER" OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS*

<table>
<thead>
<tr>
<th>Felony Category &quot;Other&quot;</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Per Cent</td>
</tr>
<tr>
<td>No Felony Category &quot;Other&quot;</td>
<td>15</td>
<td>68.2</td>
</tr>
<tr>
<td>Felony Category &quot;Other&quot;</td>
<td>7</td>
<td>31.8</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Felony Category "other" includes such crimes as simple burglary, parole violation, etc.

As can be seen from the data, a slightly larger percentage of inmates in the control group (39 per cent) fell into the felony category "other" than did the inmates in the experimental group (32 per cent).
As was previously mentioned three pre-tests were administered to the inmates in the experimental and the control groups, and they were the Self-Esteem Inventory Scale, an Adston's Mathematical Test, and an Adston's Reading Test. The same three tests were given as post-tests to the inmates in the study. Table XV presents the mean scores on all three pre-tests for both groups.

**TABLE XV**

A COMPARISON OF THE MEAN OF THE PRE-SELF-ESTEEM INVENTORY (SEI)\# PRE-MATH, AND PRE-READING SCORES OF THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS

<table>
<thead>
<tr>
<th>Pre-Test</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = 22)</td>
<td>(N = 31)</td>
</tr>
<tr>
<td></td>
<td>Mean Scores</td>
<td>Mean Scores</td>
</tr>
<tr>
<td>SEI</td>
<td>32.0</td>
<td>34.7</td>
</tr>
<tr>
<td>Math</td>
<td>33.3</td>
<td>33.0</td>
</tr>
<tr>
<td>Reading</td>
<td>53.5</td>
<td>47.6</td>
</tr>
</tbody>
</table>

\*t = 1.45, d.f. 51, N.S. at .05 level

While there were some differences in the mean scores of these two groups relative to the three pre-tests, over-all the two groups were very similar. The self-esteem inventory gain score values reflected a difference between the two groups but this difference was not significant statistically at the .05 level. The math mean gain score values were approximately the same for the two groups.

When the Self-Esteem Inventory (SEI) Scale mean gain scores and the Math Test mean gain scores for the experimental group were compared with the same two variables in the control group,
there was a marked difference between the groups. The data is presented in Table XVI.

**TABLE XVI**


<table>
<thead>
<tr>
<th></th>
<th>SEI Gain Scores</th>
<th>Math Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental Group</strong></td>
<td><strong>Control Group</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SEI Gain Scores</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Range</strong></td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td><strong>Low-</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td><strong>Experimental Group</strong></td>
<td><strong>(N = 22)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>2.9</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Gain Scores</strong></td>
<td>5.4</td>
<td>33</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>-6 to 12</td>
<td>-2 to 33</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>5.6</td>
<td>6.5</td>
</tr>
<tr>
<td><strong>Low-</strong></td>
<td>-15 to 11</td>
<td>-18 to 16</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>-15 to 11</td>
<td>-18 to 16</td>
</tr>
</tbody>
</table>

The most striking feature of the data is the fact that both the self-esteem inventory SEI mean gain scores and the Math mean gain scores for the control group had a negative value. If the scores are rounded off to the next highest value, and if this is done for both the experimental and control groups, it then appears that for every three units of Math mean gain score brought about within the group, there is a corresponding one unit change in the SEI mean gain score. This appears to be true regardless of whether the Math mean gain score is brought about in a positive or negative direction. The standard deviation for both the SEI mean gain score and the Math mean gain score were approximately the same for both the experimental and the control
groups. The measured differences in the range for both the SEI mean gain score and the Math mean gain score were also approximately the same for both groups.

The main objective of this study was to determine the effect of a mathematical education model on self-esteem of male prison inmates. To achieve this objective a number of null hypotheses were stipulated.

**Major Hypotheses**

**Null Hypothesis No. 1:** There is no difference in self-esteem inventory (SEI) mean gain scores between the experimental group subjects and the control group subjects.

The relationship of S.E.I. mean gain scores to the experimental and the control groups is presented in Table XVII. The S.E.I. mean gain score for the inmates in the experimental group (2.9) was higher than that for the inmates in the control group (-1.3). This observed difference was significant statistically at the .0091 level. Therefore null hypothesis No. 1 was rejected.

**TABLE XVII**

A COMPARISON OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES, STANDARD DEVIATIONS AND RANGES FOR THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS*

<table>
<thead>
<tr>
<th>Group</th>
<th>S.E.I. Mean Gain Scores</th>
<th>Standard Deviation</th>
<th>Range Low-High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>2.9</td>
<td>5.4</td>
<td>-6 to 12</td>
</tr>
<tr>
<td>(N = 22)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-1.3</td>
<td>5.6</td>
<td>-15 to 11</td>
</tr>
<tr>
<td>(N = 31)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F = 7.363 with 1 and 51 d.f., P < 0.0091; R² = .126; Mean = 0.4717
Null Hypothesis No. 2: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects.

The relationship of Math mean gain scores to the experimental and the control groups is presented in Table XVIII. It was expected that those inmates who received individualized tutoring in mathematics would significantly increase their mathematical skills. This expectation was confirmed by the data herein presented.

### TABLE XVIII

A COMPARISON OF MATHEMATICAL (MATH) MEAN GAIN SCORES, STANDARD DEVIATIONS, AND RANGES FOR THE INMATES IN THE EXPERIMENTAL AND CONTROL GROUPS*

<table>
<thead>
<tr>
<th>Group</th>
<th>Math Mean Gain Scores</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>9.0</td>
<td>9.0</td>
<td>-2 to 33</td>
</tr>
<tr>
<td>(N = 22)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>-2.9</td>
<td>6.5</td>
<td>-18 to 16</td>
</tr>
<tr>
<td>(N = 31)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* F = 31.334 with 1 and 51 d.f., P < 0.0001; R² = .381; Mean = 2.0566

As can be seen from the data the inmates who received individualized tutoring in mathematics in the experimental group made large gains in scores. The inmates in the experimental group had a Math mean gain score of 9.0, while those inmates in the control group had a Math mean gain score of -2.9. This observed difference was highly significant statistically at the .0001 level. In light of this significance level null hypothesis No. 2 was rejected.
Sub-Hypotheses

Null Hypothesis No. 1: There is no difference in self-esteem inventory (SEI) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for race.

With race being such a dominant factor within most prison populations, it was anticipated that there would be a significant relationship between SEI adjusted mean gain scores when considering group, race, and group-by-race. The data pertaining to these relationships is presented in Table XIX.
TABLE XIX

TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (SEI) MEAN GAIN SCORES OF INMATES CONTROLLING FOR GROUP, RACE, AND GROUP-BY-RACE*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>SEI Adjusted Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.1118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>22</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>31</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Race:</td>
<td>0.7218</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>13</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>40</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Group-by-Race:</td>
<td>0.2175</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental White</td>
<td>8</td>
<td>1.9**</td>
<td></td>
</tr>
<tr>
<td>Experimental Black</td>
<td>14</td>
<td>3.5**</td>
<td></td>
</tr>
<tr>
<td>Control White</td>
<td>5</td>
<td>1.2**</td>
<td></td>
</tr>
<tr>
<td>Control Black</td>
<td>26</td>
<td>-1.7**</td>
<td></td>
</tr>
</tbody>
</table>

*Model: Self-Esteem Inventory (SEI) Mean Gain Scores = Group + Race + Group-by-Race, Significant at the .25 level for Group and Group-by-Race, not significant for Race; F = 2.975 with 3 and 49 d.f., P ≤ 0.0398; R² = .154; Mean = 0.4717.

**Raw Means

When controlling for race, an expected relationship was confirmed. The SEI adjusted mean gain score for inmates in the experimental group was 2.7, while the S.E.I. adjusted mean gain
score for inmates in the control group was -0.3. This observed difference was significant statistically at the .1118 level. Null hypothesis No. 1 was therefore rejected. It is quite apparent that the experimental group subjects achieved higher levels of self-esteem scores than did the control group subjects.

Null Hypothesis No. 2: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between White subjects and Black subjects.

Little relationship was found when considering race. The S.E.I. adjusted mean gain scores for White subjects was 1.5, while the S.E.I. adjusted mean gain scores for Black subjects was 0.9. The observed difference was not significant statistically at the .7218 level. Null hypothesis No. 2 was accepted. White subjects achieved higher levels of self-esteem than did Black subjects but not significantly so.

Null Hypothesis No. 3: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-race.

Although the relationship found for the S.E.I. mean gain scores when considering group-by-race was not strong, it was nevertheless significant statistically. The S.E.I. mean gain score for inmates in the experimental group was 1.9 for Whites and 3.5 for Blacks, while the S.E.I. mean gain scores for inmates in the control group were 1.2 for Whites and -1.7 for Blacks. These obtained differences
were significant statistically at the .2175 level. In light of this obtained significance level null hypothesis No. 3 was rejected. It appears that Blacks who received the treatment did better in S.E.I. gain scores than did Whites in the same circumstance, but Blacks who did not receive the treatment had lower S.E.I. gain scores than did Whites in the same situation.

**Null Hypothesis No. 4:** There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for race. Generally, mathematics is a subject that is difficult for many people; therefore it was expected that there would be a significant relationship between Math adjusted mean gain scores when considering group, race, and group-by-race. Table XX presents the data pertaining to these relationships.
TABLE XX

TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF MATHEMATICAL (MATH) MEAN GAIN SCORES OF INMATES, CONTROLLING FOR GROUP, RACE, AND GROUP-BY-RACE*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>Math Adjusted Mean Gain Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>22</td>
<td>7.9</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>31</td>
<td>-2.3</td>
</tr>
<tr>
<td>Race:</td>
<td>0.1965</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
<td>13</td>
<td>1.2</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td>40</td>
<td>4.4</td>
</tr>
<tr>
<td>Group-by-Race:</td>
<td>0.0469</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental White</td>
<td></td>
<td>8</td>
<td>3.9**</td>
</tr>
<tr>
<td>Experimental Black</td>
<td></td>
<td>14</td>
<td>11.9**</td>
</tr>
<tr>
<td>Control White</td>
<td></td>
<td>5</td>
<td>-1.4**</td>
</tr>
<tr>
<td>Control Black</td>
<td></td>
<td>26</td>
<td>-3.2**</td>
</tr>
</tbody>
</table>

*Model: Mathematical (Math) Mean Gain Scores = Group + Race + Group-by-Race; Significant at the .05 level for Group, and Group-by-Race; Significant at the .25 Level for Race; F = 13.503 with 3 and 49 d.f.; P < 0.0001; R^2 = .453; Mean = 2.0566.

** Raw Means
When controlling for race, an expected relationship was confirmed. The Math adjusted mean gain score for inmates in the experimental group was 7.9, while the Math adjusted mean gain score for inmates in the control group was -2.3. This observed difference was highly significant statistically at the .0001 level. Null hypothesis No. 4 was therefore rejected. As expected the experimental group subjects achieved higher levels of mathematical skills than did the control group subjects.

**Null Hypothesis No. 5:** There is no difference in mathematical (Math) adjusted mean gain scores between White subjects and Black subjects.

When considering race, the Math adjusted mean gain score for White subjects was 1.2, while the Math adjusted mean gain score for Black subjects was 4.4. The observed difference was significant statistically at the .1965 level. In light of this obtained significance level null hypothesis No. 5 was rejected. The Whites in the experimental group exhibited a greater S.E.I. unit gain (1.9) per unit gain in Math (1.2) or \(\frac{1.9}{1.2}\) than did the Blacks who had a S.E.I. unit gain (3.5) per unit gain in Math (4.4) or \(\frac{3.5}{4.4}\).

**Null Hypothesis No. 6:** There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-race.

Considering group-by-race, it was found that the Math mean gain score for inmates in the experimental group was 3.9 for Whites and 11.9 for Blacks, while the Math mean gain score for inmates in the control group was -1.4 for Whites and -3.2 for Blacks. These
observed differences were significant statistically at the .0469 level. Therefore, null hypothesis No. 6 was rejected. Again, as with S.E.I. gain scores, the Blacks who received no treatment appeared to have a lower math mean gain score (-3.2) than did White subjects who received no treatment (White's Math mean gain score - 1.4).

**Null Hypothesis No. 7:** There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for residential status.

It was anticipated that there would be a significant relationship between S.E.I. adjusted mean gain scores when considering group, residential status, and group-by-residential status. The data pertaining to these relationships is presented in Table XXI.
### TABLE XXI

**TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES, CONTROLLING FOR GROUP, RESIDENTIAL STATUS, AND GROUP-BY-RESIDENTIAL STATUS* **

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>S.E.I. Adjusted Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>22</td>
<td>2.9</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>31</td>
<td>-1.5</td>
</tr>
<tr>
<td>Residential Status</td>
<td>0.5529</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>33</td>
<td>1.2</td>
</tr>
<tr>
<td>Group-by Residential Status</td>
<td>0.7211</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Rural</td>
<td></td>
<td>10</td>
<td>2.7**</td>
</tr>
<tr>
<td>Experimental Urban</td>
<td></td>
<td>12</td>
<td>3.1**</td>
</tr>
<tr>
<td>Control Rural</td>
<td></td>
<td>10</td>
<td>-2.3**</td>
</tr>
<tr>
<td>Control Urban</td>
<td></td>
<td>21</td>
<td>-0.8**</td>
</tr>
</tbody>
</table>

*Model: Self-Esteem Inventory (S.E.I.) Mean Gain Scores = Group + Residential Status + Group-by Residential Status; Significant at the .25 Level for Group, not significant for Residential Status and Group-by-Residential Status; F = 2.564 with 3 and 49 d.f., P ≤ 0.0643; R² = .136; Mean 0.4717

**Raw Means
It was found that when controlling for residential status an expected relationship was confirmed. The S.E.I. adjusted mean gain score for inmates in the experimental group was 2.9, while the S.E.I. adjusted mean gain score for the inmates in the control group was -1.5. This observed difference was highly significant statistically at the .0083 level. Therefore, null hypothesis No. 7 was rejected. When controlling for residential status, the experimental group subjects still scored higher on the self-esteem inventory than did the control group subjects.

**Null Hypothesis No. 8:** There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between rural subjects and urban subjects.

A slight relationship was found when considering residential status. The S.E.I. adjusted mean gain score for the rural subjects was 0.2, while the S.E.I. adjusted mean gain score for urban subjects was 1.2. The observed difference was not significant statistically at the .5529 level, however. Null hypothesis No. 8 was accepted. From the data it appears that urban subjects enjoyed a somewhat higher level of self-esteem than did the rural subjects.

**Null Hypothesis No. 9:** There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-residential status.
Practically no relationship was found when considering group-by-residential status. The S.E.I. mean gain score for inmates in the experimental group was 2.7 for rural subjects and 3.1 for the urban subjects, while the S.E.I. mean gain score for inmates in the control group was -2.3 for rural subjects and -0.8 for urban subjects. These differences were not significant statistically at the .7211 level. Therefore, null hypothesis No. 9 was accepted. From the data it appears that the urban subjects exhibited a somewhat higher level of self-esteem in both the experimental and control groups than did the rural subjects.

Null Hypothesis No. 10: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for residential status.

It was expected that there would be a significant relationship between Math adjusted mean gain scores when considering group, residential status, and group-by-residential status. Table XXII presents the data pertaining to these relationships.
TABLE XXII

TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF MATHEMATICAL (MATH) MEAN GAIN SCORES OF INMATES, CONTROLLING FOR GROUP, RESIDENTIAL STATUS AND GROUP-BY-RESIDENTIAL STATUS*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>Math Adjusted Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>22</td>
<td>8.9</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>31</td>
<td>-2.6</td>
</tr>
<tr>
<td>Residential Status:</td>
<td>0.8181</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td>20</td>
<td>2.9</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>33</td>
<td>3.4</td>
</tr>
<tr>
<td>Group-by-Residential Status:</td>
<td>0.3157</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Rural</td>
<td></td>
<td>10</td>
<td>7.5**</td>
</tr>
<tr>
<td>Experimental Urban</td>
<td></td>
<td>12</td>
<td>10.3**</td>
</tr>
<tr>
<td>Control Rural</td>
<td></td>
<td>10</td>
<td>-1.7**</td>
</tr>
<tr>
<td>Control Urban</td>
<td></td>
<td>21</td>
<td>-3.4**</td>
</tr>
</tbody>
</table>

*Model: Mathematical (Math) mean gain scores = Group + Residential Status + Group-by-Residential Status; Significant at the .05 Level for Group, not significant for Residential Status and Group-by-Residential Status; \( F = 10.596 \) with 3 and 49 d.f., \( P \ll 0.0001; \)
\( R^2 = .393; \) Mean = 2.0566

**Raw Means
As anticipated, when controlling for residential status, the relationship was confirmed. The Math adjusted mean gain score for inmates in the experimental group was 8.9 compared with the Math adjusted mean gain score for inmates in the control group of -2.6. This observed difference was highly significant statistically at the .0001 level. Therefore, null hypothesis No. 10 was rejected. When controlling for residential status the experimental group subjects achieved a higher level of mathematical skill than did the control group subjects.

**Null Hypothesis No. 11:** There is no difference in mathematical (Math) adjusted mean gain scores between rural subjects and urban subjects.

A very slight relationship was found when considering residential status. The Math adjusted mean gain score for rural subjects was 2.9, while the Math adjusted mean gain score for urban subjects was 3.4. The observed difference was not significant statistically, however at the .8181 level. Null hypothesis No. 11 was accepted. The data indicates that urban subjects achieved a somewhat higher level of mathematical skill than did the rural subjects.

**Null Hypothesis No. 12:** There is no difference in mathematical (Math) mean gain scores between the experimental group subjects, considering group-by-residential status.
A small relationship was found when considering group-by-residential status. The math mean gain score for inmates in the experimental group was 7.5 for rural subjects and 10.3 for the urban subjects. On the other hand, the Math mean gain score for inmates in the control group was -1.7 for rural subjects and -3.4 for urban subjects. These observed differences were not significant statistically at the .3157 level. Therefore, null hypothesis No. 12 was accepted. Again, it appears from the data that the urban subjects achieved a somewhat higher level of mathematical skill in both the experimental and control groups than did the rural subjects.

**Null Hypothesis No. 13:** There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for religious status.

Religion is a very important element in social control, and therefore it was expected that there would be a significant relationship between S.E.I. adjusted mean gain scores when considering group, religious status, and group-by-religious status. The data pertaining to these relationships is presented in Table XXIII.
TABLE XXIII

TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES, CONTROLLING FOR GROUP, RELIGIOUS STATUS, AND GROUP-BY-RELIGIOUS STATUS*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>S.E.I. Adjusted Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0503</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>22</td>
<td>2.9</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>31</td>
<td>-0.6</td>
</tr>
<tr>
<td>Religious Status:</td>
<td>0.3938</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roman Catholic</td>
<td></td>
<td>14</td>
<td>1.9</td>
</tr>
<tr>
<td>Protestant</td>
<td></td>
<td>39</td>
<td>0.4</td>
</tr>
<tr>
<td>Group-by-Religious Status:</td>
<td>0.4342</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Roman Catholic</td>
<td></td>
<td>6</td>
<td>3.0**</td>
</tr>
<tr>
<td>Experimental Protestant</td>
<td></td>
<td>16</td>
<td>2.9**</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roman Catholic</td>
<td></td>
<td>8</td>
<td>0.9**</td>
</tr>
<tr>
<td>Protestant</td>
<td></td>
<td>23</td>
<td>-2.0**</td>
</tr>
</tbody>
</table>

*Model: Self-Esteem Inventory (S.E.I.) Mean Gain Scores = Group + Religious Status + Group-by-Religious Status; Significant at the .05 Level for Group, not significant for Religious Status and Group-by-Religious Status; F = 2.971 with 3 and 49 d.f., P < 0.0400; R² = .154; Mean = 0.4717

** Raw Means
When controlling for religious status, the expected relationship was confirmed. The S.E.I. adjusted mean gain score for inmates in the experimental group was 2.9, while the S.E.I. adjusted mean gain score for inmates in the control group was -0.6. This difference was significant statistically at the .0503 level. Therefore null hypothesis No. 13 was rejected. When controlling for religious status, the experimental group subjects achieved a higher level of self-esteem than did the control group subjects.

Null Hypothesis No. 14: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between Roman Catholic subjects and Protestant subjects.

A slight relationship was found when considering religious status. The S.E.I. adjusted mean gain score for Roman Catholic subjects was 1.9 as compared with the S.E.I. adjusted mean gain score of 0.4 for Protestant subjects. The observed difference was not, however, significant statistically at the .3938 level. Null hypothesis No. 14 was accepted. From the data it appears that Roman Catholic subjects exhibited a somewhat higher level of self-esteem than did the Protestant subjects.

Null Hypothesis No. 15: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-religious status.
Here again, a slight relationship was found when considering group-by-religious status. The S.E.I. mean gain score for inmates in the experimental group was 3.0 for Roman Catholic subjects and 2.9 for the Protestant subjects, contrasted with the S.E.I. mean gain scores for inmates in the control group of 0.9 for Roman Catholic subjects and -2.0 for Protestant subjects. These observed differences were not significant statistically at the .4342 level. Therefore, null hypothesis No. 15 was accepted. From the data it appears that the Roman Catholic subjects showed a slightly higher level of self-esteem in both the experimental and control groups than did the Protestant subjects.

Null Hypothesis No. 16: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for religious status.

It was expected that there would be a significant relationship between Math adjusted mean gain scores when considering group, religious status, and group-by-religious status. Table XXIV presents the data pertaining to these relationships.
TABLE XXIV

TWO WAY FACTORIAL ANALYSIS OF VARIANCE OF MATHEMATICAL (MATH) MEAN GAIN SCORES OF INMATES, CONTROLLING FOR GROUP, RELIGIOUS STATUS, AND GROUP-BY-RELIGIOUS STATUS*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>Math Adjusted Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>22</td>
<td>7.8</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>31</td>
<td>-3.3</td>
</tr>
<tr>
<td>Religious Status:</td>
<td>0.1380</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roman Catholic</td>
<td>14</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>Protestant</td>
<td>39</td>
<td></td>
<td>4.0</td>
</tr>
<tr>
<td>Group-by-Religious Status:</td>
<td>0.4282</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Roman Catholic</td>
<td>6</td>
<td></td>
<td>5.0**</td>
</tr>
<tr>
<td>Experimental Protestant</td>
<td>16</td>
<td></td>
<td>10.5**</td>
</tr>
<tr>
<td>Control Roman Catholic</td>
<td>8</td>
<td></td>
<td>-4.1**</td>
</tr>
<tr>
<td>Control Protestant</td>
<td>23</td>
<td></td>
<td>-2.4**</td>
</tr>
</tbody>
</table>

*Model: Mathematical (Math) Gain Scores = Group, Religious Status, and Group-by-Religious Status; Significant at the .05 Level for Group and Significant at the .25 Level for Religious Status; Not significant for Group-by-Religious Status; F = 11.436 with 3 and 49 d.f., P ≪ 0.0001; R² = .412; Mean = 2.0566

**Raw Means
As anticipated, when controlling for religious status, the expected relationship was confirmed. The Math adjusted mean gain score for inmates in the experimental group was 7.8 while the Math adjusted mean gain score for inmates in the control group was -3.3. This observed difference was highly significant statistically at the .0001 level. Therefore, null hypothesis No. 16 was rejected. When controlling for religious status the experimental group subjects showed a higher level of mathematical skill than did the control group subjects.

Null Hypothesis No. 17: There is no difference in mathematical (Math) adjusted mean gain scores between the Roman Catholic subjects and the Protestant subjects.

A relationship was found when considering religious status. The Math adjusted mean gain score for Roman Catholic subjects was 0.4 as contrasted with the Math adjusted mean gain score of 4.0 for the Protestant subjects. The difference was significant statistically at the .1380 level. Null hypothesis No. 17 was rejected. The data indicates that Protestant subjects enjoyed a significantly higher level of mathematical skill than did the Roman Catholic subjects.

Null Hypothesis No. 18: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects, considering group-by-religious status.

A slight relationship was found when considering group-by-religious status. The Math mean gain score for inmates in the
Experimental group was 5.0 for Roman Catholic subjects and 10.5 for the Protestant subjects. The Math mean gain score for inmates in the control group was -4.1 for Roman Catholic subjects and -2.4 for Protestant subjects. These obtained differences were not significant statistically at the .4282 level. Therefore, null hypothesis No. 18 was accepted. Again, it appears from the data that the Protestant subjects achieved a somewhat higher level of mathematical skill in both the experimental and control groups than did the Roman Catholic subjects.

**Null Hypothesis No. 19:** There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for age.

Age being a relevant variable with regard to most forms of behavior, it was expected that there would be a significant relationship between S.E.I. adjusted mean gain scores by group controlling for age. Table XXV presents the data pertaining to this relationship.
TABLE XXV

ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I) MEAN GAIN SCORES OF INMATES BY GROUP, CONTROLLING FOR AGE*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>S.E.I. Adjusted Mean Gain Scores</th>
<th>Age Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0752</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>16</td>
<td>3.0</td>
<td>31.0</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>20</td>
<td>-0.8</td>
<td>31.7</td>
<td></td>
</tr>
</tbody>
</table>

*Model: Self-Esteem Inventory (S.E.I.) Mean Gain Scores = Group + age; Significant at the .25 Level For Group, not significant For Age; F = 1.692 with 2 and 33 d.f.; P < 0.1983; R^2 = .093; Mean = 0.8889

The expected relationship for age was confirmed. The S.E.I. adjusted mean gain score for inmates in the experimental group was 3.0, while the S.E.I. adjusted mean gain score for inmates in the control group was -0.8. This observed difference was significant statistically at the .0752 level. Therefore, null hypothesis No. 19 was rejected. When controlling for age, the experimental group subjects achieved a higher level of self-esteem than did the control group subjects.

Null Hypothesis No. 20: There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for age.
It was expected that there would be a significant relationship between math adjusted mean gain scores by group, controlling for age. Table XXVI presents the data pertaining to this relationship.

**TABLE XXVI**

**ANALYSIS OF VARIANCE OF MATHEMATICAL (MATH) MEAN GAIN SCORES OF INMATES BY GROUP, CONTROLLING FOR AGE***

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>Math Adjusted Mean Gain Scores</th>
<th>Age Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>0.0001</td>
<td>16</td>
<td>8.6</td>
<td>31.0</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>20</td>
<td>-2.4</td>
<td>31.7</td>
</tr>
<tr>
<td>Age:</td>
<td>0.1069</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Model: Mathematical (Math) Mean Gain Scores = Group + age; Significant at the .05 Level For Group and Significant at the .25 Level for Age; F = 11.205 with 2 and 33 d.f., P < 0.0004; \(R^2 = .404\); Mean = 2.4722

As anticipated, when controlling for age, the expected relationship was confirmed. The Math adjusted mean gain score for inmates in the experimental group was 8.6. On the other hand, the Math adjusted mean gain score for inmates in the control group was -2.4. This observed difference was highly significant statistically at the .0001 level. Therefore, null hypothesis No. 20 was rejected. The data clearly demonstrates that when controlling for age the experimental group subjects achieved a higher level of mathematical skill than did the control group subjects.
Null Hypothesis No. 21: There is no difference in self-esteem inventory (S.E.I.) adjusted mean gain scores between the experimental group subjects and the control group subjects, controlling for IQ.

Certainly a limiting factor for behavior would be the IQ of an individual, therefore, it was expected that there would be a significant relationship between S.E.I. adjusted mean gain scores by group, controlling for IQ. Table XXVII presents the data pertaining to this relationship.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>S.E.I. Adjusted Mean Gain Scores</th>
<th>IQ Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0111</td>
<td></td>
<td>3.0</td>
<td>89.6</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>29</td>
<td>-1.3</td>
<td>89.4</td>
</tr>
<tr>
<td>IQ</td>
<td>0.8490</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Model: Self-Esteem Inventory (S.E.I.) Mean Gain Scores = Group + IQ; Significant at the .05 Level for Group, not Significant for IQ; F = 3.516 with 2 and 47 d.f., P < 0.0367; R² = 0.130; Mean = 0.5400.

Controlling for IQ, the expected relationship was confirmed. The S.E.I. adjusted mean gain score for inmates in the experimental group was 3.0 as compared with the S.E.I. adjusted mean gain score of 1.3 for inmates in the control group. This observed
difference was significant statistically at the .011 level. Therefore, null hypothesis No. 21 was rejected. With this significance level being obtained, it is clear that when controlling for IQ the experimental group subjects exhibited higher self-esteem scores than did the control group subjects.

**Null Hypothesis No. 22:** There is no difference in mathematical (Math) adjusted mean gain scores between the experimental group subjects, and the control group subjects, controlling for IQ.

Because IQ is related to ability in a general sense, it was expected that there would be a significant relationship between Math adjusted mean gain scores by group controlling for IQ. Table XXVIII presents the data pertaining to this relationship.

**TABLE XXVIII**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Significance Level</th>
<th>N</th>
<th>Math Adjusted Mean Gain Scores</th>
<th>IQ Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td>21</td>
<td>9.5</td>
<td>89.6</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>29</td>
<td>-3.2</td>
<td>89.4</td>
</tr>
<tr>
<td>IQ:</td>
<td>0.2750</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Model: Mathematical (Math) Mean Gain Scores = Group and IQ;
Significant at the .05 Level for Group, not significant for IQ;
F = 17.357 with 2 and 47 d.f., P ≤ 0.0001; R² = .425; Mean = 2.1400
The Math adjusted mean gain score for inmates in the experimental group was 9.5, while the Math adjusted mean gain score for inmates in the control group was -3.2 the difference was highly significant statistically at the .0001 level. Therefore, null hypothesis No. 22 was rejected. Again the data clearly demonstrates that when controlling for IQ, the experimental group subjects achieved a higher level of mathematical skill than did the control group subjects.

Sub-Hypotheses for Experimental Group

Null Hypothesis No. 1: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the IQ mean score of the subjects in the experimental group.

Null Hypothesis No. 1A: It is expected that as the experimental group subjects' IQ mean score increases that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the experimental group subjects.

Since self-esteem inventory (S.E.I.) mean gain score and IQ mean score are interval level data, Pearson's product moment correlation statistical technique was employed to determine if there was a relationship between the two variables. This same statistical technique was employed for null hypothesis No. 1 through null hypothesis No. 4 in this section.

The correlation between the self-esteem inventory (S.E.I.) mean gain score and the IQ mean score for the experimental group was -0.1088, with a significance level of .6433.
It is apparent that there was little correlation between these two variables and that what correlation did exist was in a negative direction. With a significance level of .6433, null hypothesis No.1 was accepted and null hypothesis No. 1A was rejected.

Null Hypothesis No. 2: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the pre-experimental reading level mean score of the subjects in the experimental group.

Null Hypothesis No. 2A: It is expected that as the experimental group subjects' pre-experimental reading level mean score increases that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the experimental group subjects.

The correlation between the self-esteem inventory (S.E.I.) mean gain score and the pre-experimental reading level mean score for the experimental group was 0.0069, with a significance level of .9742.

There was little correlation between these two variables. With a significance level of .9742, null hypothesis No. 2 was accepted and null hypothesis No. 2A was rejected.

Null Hypothesis No. 3: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the age mean of the subjects in the experimental group.
Null Hypothesis No. 3A: It is expected that as the experimental group subjects' mean age increases that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the experimental group subjects.

The correlation between the self-esteem inventory (S.E.I.) mean gain score and the age mean for the experimental group was 0.2593, with a significance level of .3339. There was a slight correlation between these two variables, but with a significance level of .3339, null hypothesis No. 3 was accepted and null hypothesis No. 3A was rejected.

Null Hypothesis No. 4: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the educational level mean of the subjects in the experimental group.

Null Hypothesis No. 4A: It is expected that as the experimental group subjects' education level means increases that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the experimental group subjects.

The correlation between the self-esteem inventory (S.E.I.) mean gain score and the mean educational level for the experimental group was -0.1894, with a significance level of .5971. There was a slight correlation between these two variables, with the correlation being in the negative direction. However, with a significance level of .5971, null hypothesis No. 4 was accepted and null hypothesis No. 4A was rejected.
Null Hypothesis No. 5: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the race of the subjects in the experimental group.

Null Hypothesis No. 5A: It is expected that regardless of the race of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXIX presents data relative to null hypotheses No.5 and No. 5A.

TABLE XXIX

ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY RACE*

<table>
<thead>
<tr>
<th>Race</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>8</td>
<td>1.9</td>
</tr>
<tr>
<td>Black</td>
<td>14</td>
<td>3.5</td>
</tr>
</tbody>
</table>

*Group by Race, S.E.I., $F = 1$ with 1 and 20 d.f., $P < 0.5110$; $R^2 = .022$; Mean = 2.9091; N.S.

As can be seen from the data in the table, the obtained difference was not significant statistically at the .25 level. Therefore, null hypothesis No. 5 was accepted and null hypothesis No. 5A was rejected. It seems that regardless of a subject's race the subject's self-esteem was increased if he was given the treatment applied to the experimental group subjects.

Null Hypothesis No. 6: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the type of crime committed by the subjects in the experimental group.
Null Hypothesis No. 6A: It is expected that regardless of the type of crime committed by the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXX presents the data relative to null hypotheses No. 6 and 6A.

TABLE XXX
SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY TYPE OF CRIME

<table>
<thead>
<tr>
<th>Type of Crime</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicide</td>
<td>2</td>
<td>9.0</td>
</tr>
<tr>
<td>Attempted Homicide.</td>
<td>1</td>
<td>7.0</td>
</tr>
<tr>
<td>Manslaughter</td>
<td>7</td>
<td>2.9</td>
</tr>
<tr>
<td>Attempted Manslaughter</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Armed Robbery</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Attempted Armed Robbery</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Simple Burglary</td>
<td>3</td>
<td>-3.7</td>
</tr>
<tr>
<td>Theft</td>
<td>1</td>
<td>10.0</td>
</tr>
</tbody>
</table>

When the data in Table XXX are examined, it can be seen that some of the cells have insufficient data to allow a determination to be made as to whether the hypotheses can be accepted or rejected. However, the cells with the largest frequencies (manslaughter and armed robbery totalling 59 per cent of the crimes committed by
this group) when combined had approximately the same self-esteem inventory (S.E.I.) mean gain score as did the experimental group as a whole (experimental 2.9; these two categories 2.9 + 3.0 average 2.9). It seems that these two categories would be representative of the type of crime committed by the majority of this group.

**Null Hypothesis No. 7:** There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the residential status of the subjects in the experimental group.

**Null Hypothesis No. 7A:** It is expected that regardless of the residential status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXI presents data relative to null hypotheses No. 7 and No. 7A.

**TABLE XXXI**

ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY RESIDENTIAL STATUS*

<table>
<thead>
<tr>
<th>Residential Status</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>10</td>
<td>2.7</td>
</tr>
<tr>
<td>Urban</td>
<td>12</td>
<td>3.1</td>
</tr>
</tbody>
</table>

*Group by Residential Status, S.E.I., \( F < 1 \) with 1 and 20 d.f., \( P < 0.8732; R^2 = .001; \) Mean = 2.9091; N.S.

The data in the table illustrates that the observed difference was not significant statistically at the .8732 level. Therefore,
null hypothesis No. 7 was accepted and null hypothesis No. 7A was rejected. Apparently the residential status of a subject was not related to a subject increasing his self-esteem if he had been given the treatment applied to the experimental group subjects.

**Null Hypothesis No. 8:** There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the marital status of the subjects in the experimental group.

**Null Hypothesis No. 8A:** It is expected that regardless of the marital status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXII presents data relative to null hypotheses No. 8 and No. 8A.

**TABLE XXXII**

**SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY MARITAL STATUS**

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>9</td>
<td>2.9</td>
</tr>
<tr>
<td>Single</td>
<td>7</td>
<td>5.1</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>8.0</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>-5.5</td>
</tr>
<tr>
<td>Widower</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Consort Non-Legal Union</td>
<td>2</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Table XXXII has cells with insufficient data to allow a determination as to whether the hypotheses can be accepted or rejected. However, the cells with the largest frequencies (married and single, comprising 72 per cent of the total categories of this group) when combined have an average self-esteem inventory (S.E.I.) mean gain score above that of the total experimental group self-esteem inventory (S.E.I.) mean gain score (Experimental 2.9 - these two categories 2.9 + 5.1 average 4.0). Therefore, it seems that these two categories would be representative of the marital status of the majority of this group.

**Null Hypothesis No. 9**: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the occupational status of the subjects in the experimental group.

**Null Hypothesis No. 9A**: It is expected that regardless of the occupational status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXIII presents the data relative to null hypotheses No. 9 and No. 9A.
TABLE XXXIII

SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY OCCUPATIONAL STATUS

<table>
<thead>
<tr>
<th>Occupational Status</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>Skilled</td>
<td>5</td>
<td>1.4</td>
</tr>
<tr>
<td>Semi-Skilled</td>
<td>4</td>
<td>6.0</td>
</tr>
<tr>
<td>Unskilled</td>
<td>12</td>
<td>2.8</td>
</tr>
</tbody>
</table>

When null hypotheses No. 9 and No. 9A are examined, it can also be seen that some of the cells have insufficient data to allow a determination to be made as to whether the hypotheses can be accepted or rejected. However, the cell with the largest frequency (unskilled and which comprises 55 per cent of the total categories of this group) shows a self-esteem inventory (S.E.I.) mean gain score comparable to that of the total experimental group self-esteem inventory (S.E.I.) mean gain score (Experimental 2.9, this category 2.8). Therefore, it seems that this category might be representative of the occupational status of the majority of this group.

Null Hypothesis No. 10: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the perception of family income level of the subjects in the experimental group.
Null Hypothesis No. 10A: It is expected that regardless of the perception of family income level of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXIV presents data relative to null hypotheses No. 10 and No. 10A.

<table>
<thead>
<tr>
<th>Perception of Family Income Level</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate</td>
<td>10</td>
<td>2.7</td>
</tr>
<tr>
<td>Marginal</td>
<td>9</td>
<td>2.4</td>
</tr>
<tr>
<td>Inadequate</td>
<td>3</td>
<td>5.0</td>
</tr>
</tbody>
</table>

*Group by Perception of Family Income, S.E.I., $F < 1$ with 2 and 19 d.f., $P < 0.7869$; $R^2 = .025$; Mean = 2.9091; N.S.

The data in the table indicates that the observed differences were not significant statistically at the .7869 level. Therefore, null hypothesis No. 10 was accepted and null hypothesis No. 10A was rejected. It seems the perception of family income level of a subject had little bearing on whether he increased his self-esteem, when he had been given the treatment applied to the experimental group subjects.
Null Hypothesis No. 11: There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and the religious status of the subjects in the experimental group.

Null Hypothesis No. 11A: It is expected that regardless of the religious status of the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXV presents data relative to null hypotheses No. 11 and No. 11A.

| TABLE XXXV |
| ANALYSIS OF VARIANCE OF SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY RELIGIOUS STATUS* |

<table>
<thead>
<tr>
<th>Religious Status</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roman Catholic</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Protestant</td>
<td>16</td>
<td>2.9</td>
</tr>
</tbody>
</table>

*Group by Religious Status, S.E.I., F < 1 with 1 and 20 d.f., P < 0.9629; \( R^2 = .000 \); Mean = 2.9091; N.S.

When viewing the data in the table, it can be seen that the observed differences are not significant statistically at the .9629 level. Therefore, null hypothesis No. 11 was accepted and null hypothesis No. 11A was rejected. It is quite clear that the religious status of a subject had little relationship to increasing self-esteem, when given the treatment applied to the experimental group subjects.
**Null Hypothesis No. 12:** There is no significant relationship between the self-esteem inventory (S.E.I.) mean gain score and who reared the subjects in the experimental group.

**Null Hypothesis No. 12A:** It is expected that regardless of who reared the experimental group subjects that there will be a significant increase in the self-esteem inventory (S.E.I.) mean gain score of the subjects in the experimental group.

Table XXXVI presents data relative to null hypotheses No. 12 and No. 12A.

**TABLE XXXVI**

**SELF-ESTEEM INVENTORY (S.E.I.) MEAN GAIN SCORES OF INMATES FOR EXPERIMENTAL GROUP BY WHOM REARED**

<table>
<thead>
<tr>
<th>Reared by</th>
<th>N</th>
<th>S.E.I. Mean Gain Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Parents</td>
<td>10</td>
<td>1.6</td>
</tr>
<tr>
<td>Mother</td>
<td>7</td>
<td>3.6</td>
</tr>
<tr>
<td>Mother and Step-Father</td>
<td>1</td>
<td>9.0</td>
</tr>
<tr>
<td>Relatives</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td>Non-Relative Guardian</td>
<td>1</td>
<td>-4.0</td>
</tr>
</tbody>
</table>

Null hypothesis No. 12 and No. 12A have cells with insufficient data to allow a determination as to whether the hypotheses can be accepted or rejected. However, the cells with the largest frequencies (natural parents and mother, which comprises 77 per cent of the total categories of this group) when combined have an
average self-esteem inventory (S.E.I.) mean gain score comparable to that of the total experimental group self-esteem inventory (S.E.I.) mean gain score (Experimental 2.9 - these two categories 1.6 + 3.6, average 2.6). Therefore, it seems that these two categories would be representative of the category of persons who reared the majority of the subjects of this group.
CHAPTER V
SUMMARY AND CONCLUSIONS

SUMMARY

It is generally held to be true by most clinicians working in correctional settings that self-esteem is a crucial aspect of the personality of the offender, sometimes even playing an important role in his being involved in unlawful behavior (51, p. 1). Self-esteem is often markedly modified by incarceration and this is possibly also related to failure on parole following institutionalization. In fact, the process of entering the society of the incarcerated is demoralizing. If you couple this with the realization that commitment to a correctional facility represents the symbolic equivalent of being ostracized from the community, then it seems that the loss of self-worth or self-esteem would be a reasonable expectation.

The importance of self-esteem as a personality dimension relating to a variety of behaviors has been discussed by Wheeler (74). However, the relationship of self-esteem to criminal behavior per se has only been explored to a limited extent.

Purpose of the Study

The primary purpose of the study was to determine the effect of a mathematical education model on self-esteem of male prison inmates.
It was felt that should the mathematical education model demonstrate that it had a positive effect on the self-esteem of male prison inmates, the model could then be used as a basic component in general rehabilitative programs presently being conducted throughout the criminal justice system.

Related Literature

Previous studies of self-esteem in male prison inmates have been limited to efforts establishing an instrument to reliably measure self-esteem of incarcerated males, and as a follow-up of this research an attempt was made to determine the changes of self-esteem of male prison inmates over specific time periods. However, the primary focus of this study was on demonstrating whether the mathematical education model utilized had a positive effect on the self-esteem of incarcerated males and, if there was a positive effect brought about by the treatment, could this model be used in new or existing correctional rehabilitative programs. A review of the literature on incarcerated males that participate in rehabilitative programs was made to establish whether this experimental male prison population had basically the same socio-economic characteristics as the incarcerated males who participated in prison rehabilitative programs throughout the United States (93). This review of the literature revealed the following similarities between these two populations. The average participating male offender throughout the United States displayed the following characteristics and the profile did not differ greatly from the
offender population in general:

1. He was between 19 and 25 years of age.

2. He came from a living area characterized by a high crime rate and high residential mobility.

3. He emerged from a "female based" household, harboring feelings of hostile dependency toward his parents.

4. He was a drop-out or push-out from high school.

5. He spent his free time "hanging around".

6. He formed superficial peer group relationships.

7. He lacked "middle class" goals, aspirations, and values.

8. He was untrained, unskilled, and with little career potential.

9. He had a history of crime which started during the early teens.

10. He had a low self-concept and lacked self-confidence.

11. He had been socialized into a culture of failure.

The participating male prison inmates in this study displayed many of the same characteristics enumerated above and they were as follows:

1. His average age at present commitment was 27 years of age. This was only slightly higher than the upper extreme of the nationally participating offender (25).

2. He generally came from the urban areas of the state; that is, approximately 55 per cent of the inmates in the experimental group came from urban areas of the state. As it is generally true for the United States, so it is generally true for Louisiana that the urban areas are characterized by high crime rates and high residential mobility.
3. He emerged from a "female based" household. This is only partially true for the inmates in the experimental group. Thirty-two per cent were raised by only their mothers. It is a common assumption that blacks come from "female based" households, and if this assumption is true then these male prison inmates who are predominantly Black (64 per cent) might harbor feelings of hostile dependency toward their parents. It is a fact that approximately 55 per cent of the inmates in the experimental group perceived their family income level as being marginal or inadequate.

4. He was typically a drop-out or push-out from high school. The inmate in the experimental group had an average of 9 years of education.

5. It can only be inferred that the inmates in the experimental group spent their free time "hanging around". However, two facts would support this inference for this particular group. First, is the fact that approximately two-thirds of this population was Black and secondly was the fact that approximately 55 per cent of these inmates were unskilled. Both of these facts would tend to support the inference that they spent their free time "hanging around". Blacks have the highest unemployment rate of any racial group, and unskilled persons have the highest unemployment rate of any occupational group (93).
6. He formed superficial peer group relationships. Again, this characteristic can only be inferred. It seems reasonable to infer that the inmates in the experimental group formed superficial peer group relationships when you consider the fact that the longest single time free since first commitment was an average of two years which would indicate a rather transient life style. In addition, there was the fact that 41 per cent of this population was single, which would also indicate a personality that avoided close personal relationships.

7. He lacked "middle class" goals, aspirations, and values. A good education is a traditional "middle class" value that relates to both goals and aspirations held by persons who occupy "middle class" positions in our society. A major factor that indicates that the inmates in the experimental group did not have "middle class" goals, aspirations and values was the average number of years of education they had which on the average was 9 years.

8. He was untrained, unskilled and with no career potential. The inmates in the experimental group were highly unskilled. In fact, approximately 55 per cent were unskilled, and another 18 per cent were semi-skilled. This amounted to about one out of four inmates being unskilled or semi-skilled. Certainly, these facts indicated that these
inmates were both untrained and unskilled. In addition to this if you add the fact that the average IQ of these inmates was 90, one can readily see that their career potential was practically nil.

9. He had a history of crime which started during the early teens. This characteristic can only be inferred. However, Louisiana has tended to treat its juvenile offenders fairly lenient as did the rest of the states. It therefore seems reasonable to assume that many of the inmates in the experimental group did start their criminal careers in their early teens, even though their average age at first commitment to the Louisiana State Penitentiary at Angola was 27 years of age.

10. He had a low self-concept and lacked self-confidence. The inmates in the experimental group certainly had a low self-concept. In fact their average self-esteem inventory scale score was 32.0. This means they only scored on the average 64 per cent on a 100 per cent scale, indicating lack of self-confidence in that in the majority of cases high school was not completed, they were not occupationally trained, and had had only 2 years of freedom since first commitment, which would indicate that in all probability lack of self-confidence was a problem.

11. He had been socialized into a culture of failure. The inmates in the experimental group in the majority of cases
(55 per cent) came from economically deprived backgrounds. If you add this to the other factors such as being untrained, unskilled, poorly educated, etc. it seems reasonable to assume that these inmates were socialized by and large into a culture of failure.

As can be seen when the inmates who participated in the rehabilitative programs nationally are compared with the inmates in the experimental group of this study they seemed to be very comparable. Therefore, if the treatment to which the experimental group inmates were exposed to brought about a positive change in the inmate's self-esteem, then it would probably have had the same effect in other male prison settings.

Methodology

Twenty-two male inmates were selected from the inmate population at the Louisiana State Police Headquarter's facility in Baton Rouge, Louisiana to participate in the experimental group. Thirty-one male inmates were selected for the control group from the inmate population at Jackson Barracks facility in New Orleans, Louisiana. The sizes of these two inmate populations were approximately 100 plus inmates and 200 plus inmates, respectively.

The sampling technique used was a stratified sample; that is, in order for an inmate to participate in the study he had to meet two basic criteria. First, he had to be within 12 months of discharge or within 12 months of qualifying for the state penitentiary work release program, and second he had to have an IQ of 80
and be able to read at the first grade level.

The method of data collection was a pre-test and post-test utilizing the following instruments:

1. Adston Mathematical Diagnostic Instrument
2. Adston Reading Test
3. The Self-Esteem Inventory Instrument

In addition to the above, a socio-economic profile was developed for both the experimental and control groups.

The inmates in the experimental group were given a pre-test consisting of the above three tests. After the pre-test, the inmates were tutored individually in mathematics by specially trained tutors for 18 weeks. At the end of the tutoring sessions, the inmates were given a post-test consisting of the same instruments utilized in the pre-test.

The inmates in the control group were given the same pre-test and post-test as were the inmates in the experimental group, but they were not tutored in mathematics.

Since the primary objective of this study was to determine if self-esteem of male prison inmates could be improved through the utilization of a mathematical education model, specific null hypotheses were established with regard to self-esteem and mathematics skills.

Increase in self-esteem in inmates (the dependent variable) were determined by subtracting the self-esteem pre-test scores from self-esteem post-test scores. The same procedure was followed
relative to increases in mathematical skill and reading skill. The tutoring in mathematics was the independent variable, and its effects were indicated by whether the inmate's self-esteem was increased. The self-esteem inventory (S.E.I.) mean gain scores and the mathematical (Math) mean gain scores were related to selected personal, social, and economic characteristics.

Two way factorial analysis of variance, analysis of variance and Pearson's product moment correlation procedures were used to test the several null hypotheses.

Major Findings

The variables, self-esteem and mathematics, were analyzed, within themselves, and as they related to selected socio-economic characteristics. Thirty-six null hypotheses and twelve alternative hypotheses were established to test the above relationships.

The data are summarized first with regard to comparability of the experimental and control groups, and second for the several null hypotheses.

Comparability of the Two Groups

When the variables age at present commitment, age, years of education, age at first commitment, longest single time free since first commitment in years, and IQ of the two groups were compared no more than one unit of measurement separated the two groups. This indicated that the two groups were very similar with regard to these particular variables.
The racial distribution of the two groups was slightly skewed. The control group was composed of approximately 20 per cent more Blacks than was the experimental group. Nevertheless, the experimental group's racial distribution was comparable to the general prison population where approximately 35 per cent were White and 65 per cent were Black.

The residential status (rural-urban) comparison was very close, with 10 per cent more urban subjects in the control group than were present in the experimental group.

One percentage point or less separated the two groups relative to their religious status distribution.

When the marital status of the two groups was compared, they were very similar with the exception of one category, and that was the married category. There were approximately 18 per cent more married inmates in the experimental group than there were in the control group.

The number of children the inmates had was slightly out of balance, with the experimental group having 13 per cent more who fell into the category of "zero" children.

The "by whom reared" variable reflected that the control group was composed of 13 per cent more inmates who were reared by their natural parents, compared with the inmates in the experimental group.

Comparing the two groups occupationally there was a rather large skew reflected in the data. The experimental group had 22 per cent more unskilled inmates than did the control group.
The single largest difference found between the two groups regarding these comparative variables was found relative to perceived family income levels. The experimental group was comprised of 25 per cent more inmates who perceived their family income as being marginal than did the control group.

Regarding the usage of alcohol the two groups were comparable; that is, there was only five percentage points or less separating the two groups relative to this variable.

The two groups were equal relative to their usage of drugs, with less than one percentage point separating them regarding this variable.

When comparing the two groups relative to the felony category entitled "other", there were 7 per cent more inmates who fell into this category in the control group than there was in the experimental group.

According to the pre-test scores, there was a difference between the two groups relative to the self-esteem variable. This difference was approximately three points, however, the difference was not significant statistically.

The final comparison of the two groups was made relative to their gain scores on the variables, self-esteem and mathematics. On both these variables the inmates in the experimental group did significantly better than did the inmates in the control group.

In summary, of the 19 variables upon which the two groups were compared, only six variables reflected a difference of 10 per cent or more between the two groups. Two of these variables which reflect
approximately 10 per cent difference between the groups were residential status and by whom reared, and two of these variables reflected approximately 20 per cent difference between the two groups, racial background and marital status. The two largest differences between the two groups were found relative to the variables, occupational status (22 per cent), and the variable, perceived family income (25 per cent).

Admittedly the two groups were not identical, but they were very similar and, considering the exploratory nature of this study, this similarity should suffice.

Major Hypotheses

Null Hypothesis No. 1: There is no difference in self-esteem inventory (S.E.I.) mean gain scores between the experimental group subjects and the control group subjects.

The observed difference between the experimental group subjects (S.E.I. mean gain score 2.9) and the control group subjects (S.E.I. mean gain score -1.3) was highly significant statistically at the .0091 level. Therefore, the null hypothesis was rejected.

Null Hypothesis No. 2: There is no difference in mathematical (Math) mean gain scores between the experimental group subjects and the control group subjects.

The observed difference between the experimental group subjects (Math mean gain score 9.0) and the control group subjects (Math mean gain score -2.9) was highly significant statistically at the .0001 level. Therefore, the null hypothesis was rejected.
Sub-Hypotheses

Two sets of sub-hypotheses were propounded. For the first set, concerned with both the experimental and control groups it was found that fourteen of the sub-hypotheses were rejected as statistically significant differences in self-esteem and mathematical skills were found to exist between the experimental and control groups. Eight of the sub-hypotheses were accepted as no statistically significant differences in self-esteem and mathematical skills were found to exist between the experimental and control group subjects. When the twelve sub-hypotheses relating only to the experimental group subjects were considered, eight of them were accepted as no statistically significant differences in self-esteem and mathematical skills were found to exist. No decision could be made as to whether to accept or reject the remaining four hypotheses because some of the cells had insufficient data.
CONCLUSIONS

Based on the findings of the study, the average experimental group subject tended to have the following distinguishing features:

1. Was a young individual generally around 31 years old
2. Was a male
3. Had approximately 9 years of education
4. Had an average IQ of 90
5. In 6 out of 10 cases was a Black
6. Had an urban background in the majority of cases
7. In 7 out of 10 cases was Protestant
8. In the majority of cases was reared by someone other than his natural parents
9. In 3 out of 10 cases was single
10. In the majority of cases was unskilled
11. In the majority of cases came from families with marginal or inadequate income
12. In 6 out of 10 cases used alcohol
13. In 7 out of 10 cases used drugs
14. Had a pre-test self-esteem inventory mean score of 32
15. Had a pre-test mathematics mean score of 33
16. Had a post-test self-esteem inventory mean gain score of 3
17. Had a post-test mathematics mean gain score of 9
It is quite evident, therefore, that these inmates had characteristics which marked them as different from the larger society. One important facet which arises is that low self-esteem is a common characteristic of male prisoners. The capability to increase the self-esteem of male prisoners is a prerequisite for any viable rehabilitation program in corrections. It is essential to deal with the male prisoners' poor self-image before attempting to modify his behavior in a pro-social direction or else in all likelihood, the latter will be a fruitless endeavor; that is, he can't have a positive feeling about the world around him when he has a negative feeling about himself.

This study has demonstrated several things, first, that the experimental group subjects could and did increase their mathematical skills and second that they could and did increase their self-esteem. The study also demonstrated that race per se did seem to be a factor in the experimental group; that is, the data did reveal that Black subjects did, on the average, do considerably better than did White subjects relative to increased self-esteem inventory scores. Conversely, those Black subjects who received no treatment had considerably lower self-esteem inventory scores than did the White subjects who received no treatment.

**Implications for Increased Self-Esteem in Male Prisoners**

This study has some implications for the professional personnel responsible for the conduct of rehabilitative programs in correctional facilities. These implications are particularly relevant to correctional administrators, who are attempting to reduce the recidivism
rate of inmates in their institutions in that they highlight an area of rehabilitation that has been traditionally overlooked, but holds great potential for reducing recidivism among male prisoners.

The following suggestions may be useful in assisting rehabilitative personnel in the correctional system in Louisiana as well as other rehabilitative personnel in the criminal justice system to fulfill their work responsibility as they go about their task of rehabilitation.

1. Utilizing what has been demonstrated in this study, namely that males who are incarcerated can, with proper assistance, increase their mathematical skills as well as increase their self-esteem. A rehabilitation specialist could develop a rehabilitation program to take advantage of this type of information; that is, the capability to increase a male prisoner's self-esteem along with the capability to increase his mathematical skill has both the potential for improving the male prisoners pro-social behavior and increasing his chance for learning a skilled occupation and/or profession. Pro-social behavior and increased earning capacity both are strong factors favorable to reducing the recidivism rate in male prisoners.

2. The Black subjects appeared to achieve higher mathematical gain scores than did White subjects and significantly so. This fact should be kept in mind by rehabilitation personnel when they are developing vocational programs for incarcerated males.
3. Further work needs to be done to replicate this study to determine if the same positive results can be obtained in a different geographic setting. It would be especially beneficial should a replication study be conducted that a larger number of subjects of both races be involved in the study.

Until such a replication study is conducted, it is suggested that no generalizations be made based upon the findings of this study.
BIBLIOGRAPHY

A. BOOKS


B. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES AND OTHER ORGANIZATIONS


C. PERIODICALS


D. UNPUBLISHED MATERIALS


APPENDIX A

SELF-ATTITUDE INVENTORY SCALE
APPENDIX A

SELF-ATTITUDE INVENTORY

Please mark each statement in the following way:

If the statement describes how you usually feel, put a check ( ) in the column, "LIKE ME".

If the statement does not describe how you usually feel, put a check ( ) in the column "UNLIKE ME".

There are no right or wrong answers.

<table>
<thead>
<tr>
<th></th>
<th>LIKE ME</th>
<th>UNLIKE ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I spend a lot of time daydreaming.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I'm pretty sure of myself.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I often wish I were someone else.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I'm easy to like.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>I never worry about anything.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>My parents and I used to have a lot of fun together.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>I wish I were younger.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>There are lots of things about myself I'd change if I could.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>I can make up my mind without too much trouble.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I'm a lot of fun to be with.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I get upset easily when dealing with others, especially with those close to me.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LIKE ME</td>
<td>UNLIKE ME</td>
</tr>
<tr>
<td>---</td>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>12.</td>
<td>I always do the right thing.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Someone always has to tell me what to do.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>It takes me a long time to get used to anything new.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>I'm often sorry for the things I do.</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I'm popular with people my own age.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I'm never unhappy.</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I'm doing the best work that I can.</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I give in easily.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I can usually take care of myself.</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>I'm usually proud of what I am doing.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I'm pretty happy.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>My parents expected too much of me.</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I like everyone I know.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I understand myself.</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>It's pretty tough to be me.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Things are all mixed up in my life.</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Younger fellows usually follow my ideas.</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>I never got scolded.</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>My parents understood me pretty well.</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>I can make up my mind and stick to it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LIKE ME</td>
<td>UNLIKE ME</td>
</tr>
<tr>
<td>---</td>
<td>---------</td>
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</tr>
<tr>
<td>32.</td>
<td>I really don't like being a male.</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>I have a low opinion of myself.</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>I don't like to be with other people.</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>There are many times when I'd like to leave home.</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>I'm never shy.</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>I often feel upset in school.</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>I often feel ashamed of myself.</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>I'm not as nice looking as most people.</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>If I have something to say, I usually say it.</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>The staff makes me feel I'm not good enough.</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>I always tell the truth.</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>I don't care what happens to me.</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>I'm a failure.</td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Most people are better liked than I am.</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>I usually felt as if my parents were pushing me.</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>I always know what to say to people.</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>I get upset easily when I'm called down about something.</td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>Things usually don't bother me.</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>I can't be depended on.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

ADSTON SURVEY TEST OF READING SKILLS
APPENDIX C

ADSTON SURVEY TEST OF READING SKILLS

Directions - Part 1

Skilled Test

<table>
<thead>
<tr>
<th>Skilled Test</th>
<th>Words for teacher to pronounce and key.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consonant b (initial)</td>
<td>bield - beld</td>
</tr>
<tr>
<td>2. Consonant d (initial)</td>
<td>dicker - dik' er</td>
</tr>
<tr>
<td>3. Consonant d (final)</td>
<td>bid</td>
</tr>
<tr>
<td>4. Consonant k (final)</td>
<td>lake</td>
</tr>
<tr>
<td>5. Short vowel a</td>
<td>cramp - a as in cap</td>
</tr>
<tr>
<td>6. Short vowel e</td>
<td>fleck - e as in met</td>
</tr>
<tr>
<td>7. Initial blend sp</td>
<td>spot</td>
</tr>
<tr>
<td>8. Initial blend tr</td>
<td>tray</td>
</tr>
<tr>
<td>9. Final blend ld</td>
<td>cold</td>
</tr>
<tr>
<td>10. Medial diagraph ph</td>
<td>elephant</td>
</tr>
</tbody>
</table>

Sentence to Read to Class

11. Verb form s  Circle the word that fits in this sentence:  That is the way he ____________.

12. Verb form ing Circle the word that fits in this sentence:  Is it ______________?

13. Prefix un  The word is LUCKY.  Circle the prefix that changes the word to mean NOT LUCKY.

14. Suffix er  The word is LONG.  Circle the ending that makes a new word from LONG.
15. Recognize unknown through sentence use

Circle the word that finishes the sentence I read:
When the truck was emptied, it was _________________.

16. Homographs

Circle the word that should finish this sentence:
You may play your favorite ____________.

17. How, who, what

I will read a sentence. You decide if the sentence or part of it tells how, who, or what. Circle the correct answer. The sentence is: "Eat the cookies one at a time." Does the phrase "one at a time" answer how, who, or what?

18. What, when, where

Circle the correct answer. The sentence is: "During the night the snow began to fall." Does the phrase "During the night" answer what, when or where?

19. Definitions and meanings

Circle the word to complete this sentence.
"When Mary found her money had been stolen, she was very _____________.

20. Definitions and meanings

Circle the word to complete this sentence.
"She hadn't known that going along the narrow ledge would be this _____________.

21. Understanding technical terms

Circle the word to complete this sentence.
The Antarctic explorers crossed the barren, frozen _________________.

22. Multiple meanings

Circle the word to complete this sentence.
She dyed the dress a new _____________.

23. Multiple meanings

Circle the word to complete this sentence.
"She gave them a questioning _____________.

24. Synonyms and synonymous phrases

Find the synonym for admonished. Circle the word.

25. Synonyms and synonymous phrases

Circle the word that fits this definition:
to make shorter by leaving out words
### APPENDIX C

**IN EACH ROW, MARK THE WORD THAT IS MOST LIKE THE ONE YOU HEAR.**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>wield</td>
<td>yield</td>
<td>bield</td>
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<td>dicker</td>
<td>bicker</td>
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<td>bid</td>
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<tr>
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<td>cold</td>
<td>could</td>
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<td>elevator</td>
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<td>rained</td>
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<td>un</td>
<td>re</td>
<td>dis</td>
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<td>ly</td>
<td>th</td>
<td>er</td>
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<tr>
<td>15.</td>
<td>unloaded</td>
<td>exploded</td>
<td>unknown</td>
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<td>16.</td>
<td>wind</td>
<td>bow</td>
<td>record</td>
</tr>
<tr>
<td>17.</td>
<td>how</td>
<td>who</td>
<td>what</td>
</tr>
<tr>
<td>18.</td>
<td>what</td>
<td>when</td>
<td>where</td>
</tr>
<tr>
<td>19.</td>
<td>sedate</td>
<td>distraught</td>
<td>improbable</td>
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<tr>
<td>20.</td>
<td>presumptious</td>
<td>pretentious</td>
<td>precarious</td>
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<tr>
<td></td>
<td>sediment</td>
<td>equator</td>
<td>terrain</td>
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<tr>
<td>---</td>
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<tr>
<td>21</td>
<td>shade</td>
<td>glance</td>
<td>dance</td>
</tr>
<tr>
<td>22</td>
<td>shade</td>
<td>glance</td>
<td>dance</td>
</tr>
<tr>
<td>23</td>
<td>polished</td>
<td>scolded</td>
<td>rejected</td>
</tr>
<tr>
<td>24</td>
<td>absurd</td>
<td>abrupt</td>
<td>abridge</td>
</tr>
</tbody>
</table>
CIRCLE THE WORD THAT MEANS THE OPPOSITE OR ABOUT THE OPPOSITE OF THE FIRST WORD.

SAMPLE: boy

<table>
<thead>
<tr>
<th>Sample</th>
<th>man</th>
<th>girl</th>
<th>shirt</th>
<th>tall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. come</td>
<td>went</td>
<td>shut</td>
<td>go</td>
<td>stop</td>
</tr>
<tr>
<td>2. teacher</td>
<td>student</td>
<td>boy</td>
<td>study</td>
<td>all</td>
</tr>
<tr>
<td>3. part</td>
<td>whole</td>
<td>none</td>
<td>was</td>
<td>like</td>
</tr>
<tr>
<td>4. below</td>
<td>under</td>
<td>above</td>
<td>around</td>
<td>inside</td>
</tr>
<tr>
<td>5. city</td>
<td>town</td>
<td>country</td>
<td>urban</td>
<td>paper</td>
</tr>
<tr>
<td>6. profit</td>
<td>earn</td>
<td>loss</td>
<td>money</td>
<td>work</td>
</tr>
<tr>
<td>7. purchase</td>
<td>sell</td>
<td>loose</td>
<td>buy</td>
<td>use</td>
</tr>
<tr>
<td>8. confine</td>
<td>free</td>
<td>stable</td>
<td>complete</td>
<td>retract</td>
</tr>
<tr>
<td>9. repel</td>
<td>act</td>
<td>discard</td>
<td>attract</td>
<td>complicate</td>
</tr>
<tr>
<td>10. increase</td>
<td>descent</td>
<td>cancel</td>
<td>annex</td>
<td>decrease</td>
</tr>
<tr>
<td>11. happy</td>
<td>excited</td>
<td>sad</td>
<td>reject</td>
<td>diverge</td>
</tr>
<tr>
<td>12. lowest</td>
<td>oldest</td>
<td>record</td>
<td>highest</td>
<td>dividend</td>
</tr>
<tr>
<td>13. positive</td>
<td>negative</td>
<td>subjective</td>
<td>objective</td>
<td>addend</td>
</tr>
<tr>
<td>14. begin</td>
<td>start</td>
<td>end</td>
<td>work</td>
<td>hire</td>
</tr>
</tbody>
</table>
15. protect
   join  save  attack  assure

16. advance
   retreat  sleep  infect  decide

17. majority
   equity  folly  minority  sanction

18. immigrate
   glory  decide  allow  emigrate

19. establish
   shipment  material  abolish  purchase

20. scoff
   tolerate  displease  burden  worship

21. unusual
   common  astonish  proposal  affect

22. subtle
   legal  canvas  obvious  arrive

23. abbreviate
   please  restrain  elongate  refrain

24. comedy
   tragedy  complete  drama  clown

25. naive
   shrill  sophisticated  learned  involved
Sky Diving

A new sport in the country today is sky diving. Sky divers jump out of airplanes thousands of feet up in the sky. They fall for hundreds of feet up in the sky. They fall for hundreds of feet before opening their parachute. They do tricks while they are falling.

This sport takes you away from everyday life into a world you have never known. It is exciting and like being in a dream. Once out of the airplane you feel as if you can float over mountains.

More people learn to sky dive each year. Men and women are interested in sky diving. This relaxing sport is one of man's newest adventures.

1. Is sky diving an old or new sport?
   A. An old sport.    C. The story does not tell.
   B. A new sport.

2. Why do sky divers fall hundreds of feet before opening their parachutes?
   A. Because they are afraid.
   B. They forget how to open their parachutes.
   C. So they can do tricks.
   D. They are in a hurry to get down.

3. Why is it like being in a dream?
   A. Because you are asleep.
   B. Because you are afraid.
   C. Because you have a parachute.
   D. Because you feel like you can float.

4. Are only men sky divers?
   A. Yes only men.    C. The story does not tell.
   B. No, men and women.
5. Are more people learning to sky dive this year than last year?
   A. Yes, more.
   B. No, fewer.
   C. The story does not tell.
When my brother Ted and I were sick, a man from the Health Department came to our house. He put a sign with the words "Mumps--- Keep Out" on our door. When the other boys saw that red sign, they knew they could not play with us. We had to stay at home until the man came back and took down the sign.

1. Who is telling this story?
   A. Ted's mother.  C. One of Ted's playmates.
   B. Ted's brother.  D. A man from the Health Department.

2. What was the matter with Ted?
   A. He did not want to play with the other boys.
   B. He did not like to go to school.
   C. He was angry with his sister.
   D. He was sick.

3. Why was the sign put on the door?
   A. To scare the people in the neighborhood.
   B. To let the doctor know someone was sick.
   C. To help keep other children from catching the mumps.
   D. To tell the attendance officer why the children were not in school.

4. Who took down the sign?
   A. The man who put it up.  C. Ted's doctor.
   B. Another man from the Health Department.  D. Ted

5. What does this story show?
   A. That boys are more likely to catch mumps than girls.
   B. That children will get sick if they play outdoors.
   C. That the Health Department tries to protect children from diseases.
   D. That sick children get very lonesome.
Louisiana, located in the south-central section of the United States, is shaped like a boot. The "foot" of the boot runs east and west with the "toe" pointing east. The "leg" of the boot runs north and south.

Louisiana is a delightful place to live, although some people might describe it as a little warm and humid. The temperature ranges from about 70 to 90 degrees for much of the year. For a few months in the winter the temperature ranges between 40 and 60 degrees. Only rarely does it dip below freezing. The rainfall, about 80 inches annually, occurs mostly in the winter and spring.

Culturally, Louisiana is two states. The northern section is populated largely by protestant anglo-saxons while south Louisiana reflects a French, Roman Catholic culture. Blacks may be found in all areas of the state. Evidences of Spanish culture may still be found in parts of old New Orleans.

Louisiana economy, once based entirely on agriculture, is rapidly changing. The petrochemical industry predominates in many of Louisiana's larger cities. This industry is made possible by the large deposits of natural gas, petroleum, and water. Louisiana is still a major producer of cotton, rice, and soybeans. Fishing and trapping are important in Louisiana's coastal areas. Because of the rich natural resources and the energy of her people Louisiana's economy should remain strong.

1. The most appropriate title for this article would be:
   A. Louisiana's Lakes and Rivers
   B. The People of Louisiana
   C. The Geography and Economy of Louisiana
   D. The Politics of Louisiana

2. The shape of Louisiana is:
   A. like a boot pointing east
   B. like a boot with the toe pointing south
   C. like a shoe pointing west
   D. like a swamp

3. Rainfall in Louisiana is about:
   A. 70 degrees per year
   B. between 70 and 90 degrees in the summer
   C. more in the summer than fall
   D. 80 inches per year
4. The second paragraph discussed Louisiana's:
   A. climate         C. people
   B. industry        D. culture

5. Many people in south Louisiana can speak:
   A. Spanish         C. Russian
   B. Italian         D. The article does not tell.

6. The most important natural resources mentioned in the article were:
   A. rivers and lakes C. forests
   B. fish            D. petroleum, natural gas, and water

7. Without its natural resources Louisiana's economy would:
   A. decline         C. become diversified
   B. improve         D. the article does not say

8. The article states that agriculture in Louisiana:
   A. should be abolished C. is of no importance
   B. should not be overloaded D. is to be found only in North Louisiana

9. The writer of the article believes that Louisiana's economy will:
   A. decline
   B. Change rapidly in the next few years
   C. continue to be strong
   D. the article does not tell

10. The attitude of this writer toward Louisiana could be described as:
    A. unfavorable       C. neutral
    B. favorable         D. this cannot be determined from the article
### APPENDIX C

In each row, mark the word that is most like the one you hear.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. wield</td>
<td>yield</td>
<td>bield</td>
</tr>
<tr>
<td>2. dicker</td>
<td>bicker</td>
<td>flicker</td>
</tr>
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<td>8. stray</td>
<td>stay</td>
<td>tray</td>
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<td>9. colt</td>
<td>cold</td>
<td>could</td>
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<tr>
<td>10. elegant</td>
<td>elephant</td>
<td>elevator</td>
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<tr>
<td>11. talks</td>
<td>talking</td>
<td>talked</td>
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<tr>
<td>12. rains</td>
<td>raining</td>
<td>rained</td>
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<td>13. un</td>
<td>re</td>
<td>dis</td>
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<td>14. ly</td>
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<td>er</td>
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<td>15. unloaded</td>
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<td>16. wind</td>
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<td>absurd</td>
<td>abrupt</td>
</tr>
</tbody>
</table>
CIRCLE THE WORD THAT MEANS THE OPPOSITE OR ABOUT THE OPPOSITE OF THE FIRST WORD.

SAMPLE: boy

man girl shirt tall

1. come
   went shut go stop
2. teacher
   student boy study all
3. part
   whole none was like
4. below
   under above around inside
5. city
   town country urban paper
6. profit
   earn loss money work
7. purchase
   sell loose buy use
8. confine
   free stable complete retract
9. repel
   act discard attract complicate
10. increase
    descend cancel annex decrease
11. happy
    excited sad reject diverge
12. lowest
    oldest record highest dividend
13. positive
    negative subjective objective addend
14. begin
    start end work hire
15. protect
    join    save    attack    assure

16. advance
    retreat    sleep    infect    decide

17. majority
    equity    folly    minority    sanction

18. immigrate
    glory    decide    allow    emigrate

19. establish
    shipment    material    abolish    purchase

20. scoff
    tolerate    displease    burden    worship

21. unusual
    common    astonish    proposal    affect

22. subtle
    legal    canvas    obvious    arrive

23. abbreviate
    please    restrain    elongate    refrain

24. comedy
    tragedy    complete    drama    clown

25. naive
    shrill    sophisticated    learned    involved
A Rat

"A rat! A rat!" said Sam.

"Help me kill it, Bob."

"It will eat holes in the bread."

"A rat is a bad thing to have in a bakery."

1. Who are the men in the story?
   A. Sid and Tom  C. Joe and Jack
   B. John and Fred  D. Bob and Sam

2. What did they want to kill?
   A. a cat  C. a rat
   B. a dog  D. a chicken

3. What would the rat do?
   A. Eat holes in the bread.  C. Steal the money.
   B. Scare the dog.  D. Drink all the milk.

4. What did Sam want?
   A. Bob's help  C. more rats
   B. A new broom  D. A grocery store

5. How large was the rat?
   A. very large  C. the story does not tell
   B. very small  D. about average
The Rodeo

The people at the rodeo stood up. They were all waiting for the big ride. Everyone had come to see Jim Smith ride Sunshine. Jim is the best rider in the country. Sunshine is the toughest horse in the show. He is a big, red horse.

Can Jim ride this big horse?

1. What did the people do?
   A. The sat down       C. The all cheered.
   B. They stood up.     D. They all booed.

2. What was the name of the horse?
   A. Sunshine          C. Jim
   B. Midnight          D. Joe

3. What did the horse look like?
   A. He was small and black.  C. He was big and red.
   B. He was big and brown.   D. He was small and grey.

4. How do we know that Jim Smith is a good rider?
   A. He rode the best horse. C. All the people came to see him.
   B. He was big and strong.  D. No one wanted to see him.

5. Did the story tell how Jim rode the horse?
   A. Yes.
   B. No.
A Fox's Home

A fox's home is called a den. It is usually found in a hole under fallen logs or in the ground. The den is where the parent foxes raise their family. Little foxes are called kits. They stay with their parents until they are able to find food for themselves. The male fox provides food for the entire family while the little foxes are small. A fox's home, like a person's home, provides shelter and safety for the family.

1. A fox's home is called:
   A. a box  C. a log
   B. a house  D. a den

2. The home is usually found:
   A. in a hole  C. in a river
   B. in a tree  D. in a town

3. The little foxes stay with their parents until:
   A. They get hungry.
   B. They are two years old.
   C. They are old enough to get their own food.
   D. They get caught.

4. The purpose of the fox's home is to provide:
   A. A place of refuge for the family.
   B. Food
   C. Water
   D. A place where they can hunt.

5. A fox's home serves the same purpose:
   A. A person's home serves.  C. No
   B. Yes  D. The story does not tell.
Sky Diving

A new sport in the country today is sky diving. Sky divers jump out of airplanes thousands of feet up in the sky. They fall for hundreds of feet up in the sky. They fall for hundreds of feet before opening their parachute. They do tricks while they are falling.

This sport takes you away from everyday life into a world you have never known. It is exciting and like being in a dream. Once out of the airplane you feel as if you can float over mountains.

More people learn to sky dive each year. Men and women are interested in sky diving. This relaxing sport is one of man's newest adventures.

1. Is sky diving an old or new sport?
   A. An old sport.  
   B. A new sport.  
   C. The story does not tell.

2. Why do sky divers fall hundreds of feet before opening their parachutes?
   A. Because they are afraid.  
   B. They forget how to open their parachutes.  
   C. So they can do tricks.  
   D. They are in a hurry to get down.

3. Why is it like being in a dream?
   A. Because you are asleep.  
   B. Because you are afraid.  
   C. Because you have a parachute.  
   D. Because you feel like you can float.

4. Are only men sky divers?
   A. Yes, only men.  
   B. No, men and women.  
   C. The story does not tell.
5. Are more people learning to sky dive this year than last year?

A. Yes, more.

B. No, fewer.

C. The story does not tell.
APPENDIX D

PENAL INMATE DATA ABSTRACT SHEET
APPENDIX D

Penal Inmate Data Abstract Sheet

Committed Name: 

L.S.P. Number: 

Age at time of Commitment: 

Crime (reason for commitment): 

Residence: 

Rural

Urban

Marital Status: No. of Children: 

Occupation: 

Education Level: 

Religion: 

Race: 

Age @ 1st Commitment: 

Number of Co-Defendants: 

Longest single time free since first commitment:

no prior commitment     under three years
under 6 months          under five years
under 18 months         5 years or more

Usage History:

marijuana     hallucinogens
amphetamines  other drugs
barbiturates  addiction
heroin and other opiates alcohol
Prior Felony Convictions (No. of):

homicide __________________________
manslaughter ______________________
other violent crimes ___________________
drug related crimes ___________________
alcohol related crimes ___________________
or other crimes ______________________

Number of Siblings:
brothers __________________ sisters __________________
half-brothers ______________ half-sisters ______________

Order of birth: Subject is _____________ of _____________

Reared by: _______________________________________

Family income: ________________________________

Full scale I.Q.: ________________________________

Tested Reading Level: _____________________________

Math Grade Level: ________________________________

Spelling Level: ________________________________

What type of educational programs does the inmate participate in now? ________________________________

How often does the inmate get passes, weekend leaves, etc.? Please specify what types of leave. ________________________________
APPENDIX E

SELF-ATTITUDE INVENTORY LETTER OF APPROVAL
14 February 1975

Mr. George A. Roundtree
Assistant Director
Corrections Sequence
School of Social Welfare
Louisiana State University
Baton Rouge, Louisiana 70803

Dear Mr. Roundtree:

Subject: Self-Attitude Inventory

Rest assured you have my full permission to utilize the Self Attitude Inventory; the Inventory together with the 'key' are enclosed. Also enclosed are the three reprints of articles on self esteem which may be of interest to you.

The Connecticut Department of Corrections recently initiated a study on self-esteem. For further information on that study you might contact Mr. Thomas DeRiemer, Research Director, Department of Corrections, 340 Capitol Avenue, Hartford, Connecticut 06115.

Good luck in your endeavors. Needless to say, I would very much appreciate receive a copy of your final report.

Very truly yours,

Lawrence A. Bennett, Ph.D.

Encls.
APPENDIX F

ADSTON DIAGNOSTIC INSTRUMENTS LETTER OF APPROVAL
In behalf of Adston Educational Enterprises, Inc., I hereby authorize George Roundtree to use the Adston Diagnostic Instruments for research purposes. I further authorize him to disseminate the results of such research in any appropriate manner.

Sam Adams, for
Adston Educational Enterprises, Inc.
VITA

The author was born in Vicksburg, Mississippi, on February 4, 1930. He attended public schools in Baton Rouge, Louisiana and graduated from Istrouma High School in 1948. He served in the United States Army (RA) during the period of 1948–49.

In 1950 the author was employed by the Louisiana State Department of Highways Testing Laboratory as an engineer's aide. In this position he was required to test materials purchased by the Department of Highways to determine if the materials met acceptable specification standards.

From 1953 to 1970 the author was employed by Kaiser Aluminum and Chemical Corporation of Baton Rouge, Louisiana as a quality control laboratory analyst.

He received the Bachelor of Science degree from Louisiana State University in 1968. This was followed by the Master of Social Work degree in 1970 from Louisiana State University.

From 1970 to 1973, the author was employed by the Louisiana Capital Area Health Planning Council as a Health Planner, Assistant Director, and Executive Director. In 1973 he accepted a position on the faculty of the School of Social Welfare, Louisiana State University.

He is presently a candidate for the Doctor of Education degree.
EXAMINATION AND THESIS REPORT

Candidate: George A. Roundtree

Major Field: Extension Education

Title of Thesis: An Experimental Study of the Effects of a Mathematical Education Model on Self-Esteem of Male Prison Inmates

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Edward W. Cassie

June 21, 1976