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THE EFFECTS OF REINFORCEMENT PROCEDURES ON NEGATIVE BEHAVIORS IN DELINQUENT GIRLS

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J. P.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Complex behavioral repertoires emerge during growth and development through a process of successive approximations to a final repertoire (Krasner and Ullman, 1968). The behaviors thus shaped imply a history of reinforcement provided by the immediate environment. A source of discrepancy sometimes exists, however, between reinforcement conditions required for successive approximations towards socially acceptable behaviors and reinforcement opportunities present in the environment. The immediate environment of most delinquents, for example, precludes the attainment of a history of reinforcement conditions leading to behaviors generally considered desirable in the dominent middle-class society. Yet it is these kinds of behaviors which institutions attempt to "instill" in delinquent youth through hit or miss methods purported to teach "discipline" but which may more often than not reinforce aggression and ignore the very behaviors which may be desirable. That is, institutions have been quick to punish but slow to reward socially acceptable behaviors.

A great amount of evidence exists which reflects the human tragedy of many institutions. Until recently, for example, female inmates at Ventura, California, were forced

to have shaved heads (Vedder, 1954). Boys have been whipped with pieces of fan belts, doubled ropes and bicycle tires in the Arizona Industrial School for Boys (Vedder, 1954). A seventeen year old boy undergoing "discipline" at the Iowa Training School collapsed and died, precipitating the mass runaway of 175 of the 565 inmates who feared for their lives (Ellington, 1948). Playing 70 pound fire hoses on the backs of nude inmates, brick-counting (the child stands erect with his eyes turned up to the ceiling), line toeing (the child stands erect and silent with both hands upraised) and rice polishing (the child crawls on his knees across a floor covered with rice grains), are further examples of efforts towards "rehabilitation" (Teeters and Reinemann, 1950).

Rehabilitation is, of course, the primary goal of institutions for delinquents. That this goal has not been met to any large degree is evidenced by the fact that between 65 and 85 percent of those who have spent time in reformatories have been classified as failures. One of the most extensive studies of this sort followed the history of offenders fifteen years after their discharge. The study, conducted by Glueck and Glueck (1943), found that only 22.6 percent of offenders committed to the Massachusetts Reformatory refrained from criminal activities during the post-institutional period. These findings seem to be consistent

with those of other writers. Of 250 boys selected as the most promising dischargees of the California Preston School of Industry, 60 percent were subsequently arrested one or more times (Ellingston, 1948). The administrators of this particular school had granted each of the boys discharges with the governor's diploma of honor. Another study followed the careers of 420 youths, of whom 311 had been committed to institutions (Healy, Bronner, 1926). Results revealed 70 percent failures for the committed cases while only 34 percent of those who had not been committed failed. Similarly, Bowler and Bloodgood (1935) found only 32 percent of 751 reformatory boys made a generally good adjustment after a period of five years or more. Even the Whittier School in California, employing techniques gaining it a reputation as a progressive institution, showed that only 28 percent of 400 boys had made a satisfactory adjustment (Fenton, 1935). Efforts to rehabilitate through psychiatric and counseling support have not been shown to be especially effective. Adamson and Dunham (1956), in a court affiliated clinic in Detroit, compared delinquents who received psychiatric treatment with a group not receiving such treatment. The outcomes were almost identical for the two groups. The Cambridge-Somerville Project, a carefully designed study with matched pairs of boys in study groups and control groups, showed no significant difference between those

receiving intensive individual attention and those not receiving such attention (Wittmer and Tufts, 1954).

One possible reason for the failure of institutions to rehabilitate youth may be the inappropriatness of the procedures employed. The impetus of rehabilitation has traditionally been directed towards instilling traditional middle-class values. That these values and the techniques of institutions may be irrelevant to delinquents, whose orientation may be towards short-term objectives and immediate gratification in attaining goals, and whose behavioral repetoires simply do not include many traditional middle-class values, is rarely considered. It has been observed, as an example, that members of minority groups or those living in ghetto-like environments tend to have a high incidence of delinquent behavior as a result of deprivation in relation to the economy:

> A middle-class person secures food, clothing, automobiles, money, and sex-gratification by non-criminal responses; he does not develop criminal responses to obtain these reinforcers. (Jeffery, 1961, p. 17).

Class variations have further been indicated in a study which showed that about three-fourths of 1000 delinquent subjects were from families which were below the "level of comfort", i.e. able to survive four months of unemployment without going on relief. (Glueck and Glueck, 1934).

Further evidence showed a correlation of +.89 between delinquency and being on relief (Shaw and McKay, 1943).

The high rate of recidivism and the ineffectiveness of traditional approaches would seem to indicate the need for new plans of action in dealing with delinquent behavior. Indeed, there are many who perenially call for a new "war" on delinquency. Little, however, which can truly be called innovative in its approach has been attempted. The present investigation, based on the assumption that many of the rewards ordinarily employed in our society are irrelevant to persons with other than middle-class backgrounds, is designed to explore the effectiveness of an alternate system of presenting rewards in establishing and maintaining behavior in delinquents which are more consonant with society's present ideals and goals.

CHAPTER II

REVIEW OF THE LITERATURE

The establishment of a motivational environment using operant techniques implicitly assumes that certain stimuli will work as effective reinforcers to promote desired behaviors. An independent variable in this process is the deprivation level present within the subject at the time of presentation of reinforcement. It is the operation of this deprivation level which makes a stimulus effective as a reinforcer. Outside the laboratory, clinic or rigidly closed social settings, the opportunity for manipulating deprivation levels of many stimuli so that their reinforcing value can be assessed is not generally available. There are, however, reinforcing stimuli which most people in our culture are deprived of at some time or other. An example is found with social reinforcers. If social approval, expensive cars, attention, money or entertainment are not supplied in abundance, it may be said that a state of deprivation for those kinds of reinforcers exists. These deprivation levels can then be used to make reinforcers contingent upon desired behaviors. Staats and Staats (1964), commenting on deprivation conditions in relationship to social status, mention hierarchies of reinforcers as being

directly dependent upon varying deprivation levels:

> Different socio-economic classes should have different hierarchies in their reinforcer systems as a result of variations in deprivation. Restrictions on the accessibility of sex reinforcers for middle-class individuals has been noted when compared to members of the lower class ....on the other hand, members of the lower socio-economic levels, not deprived of many other reinforcers, such as money, fine clothes, prestigeful jobs and social approval. (Staats and Staats, 1964, p. 311)

The kinds of social systems people live in thus has direct relationship to levels of deprivation. The closed system of a mental hospital provides hierarchies of deprivation levels not usually found in, for example, a maximum security prison. And certainly prisons reflect different levels of deprivation than can be found in society at large. The following research is included to indicate the applicability of operant conditioning techniques in systems offering varying opportunities in establishing deprivation levels.

A. MODIFICATION OF BEHAVIOR UNDER CONDITIONS OF MAXIMAL ENVIRONMENTAL CONTROL

The process of establishing systems of rewards contingent upon desired behaviors is greatly facilitated if control of the total environment is gained, permitting wide latitude in establishing deprivation levels of reinforcers. This control, while precluded in most environments as a result of administrative, ethical or philosophical

biases, is possible in the hospital setting. Here the seriousness of the behavioral problems and the fact that patients have been isolated from the community under the care of a professional staff permit greater flexibility in arranging reinforcement procedures. A large variety of motivational events can thus be maintained throughout each 24 hour day, seven days a week, establishing what might be described as a total motivational environment.

Working in such an environment and using tokens as conditioned reinforcers to bridge the delay between behavior and reinforcement, Ayllon and Azrin attempted six experiments to strengthen behavior of psychotics in a mental hospital (Ayllon and Azrin, 1965). The fundamental objective of this research was to develop methods that enable mental patients to function independently and effectively. Thus, emptying trays left on tables, serving meals, washing dishes, and waiting on tables were rewarded with tokens. Patients could exchange these tokens for reinforcers at the commissary or at the nurse's station. The results of the six experiments demonstrated that the reinforcement procedure was effective in maintaining desired performances. In each of the six experiments, performance decreased to a near-zero level when reinforcement was discontinued but reintroduction of the reinforcement procedure restored and maintained performance at a high level.

The token exchange system was also used to tame the extraordinarily agressive behaviors of a group of 4 year old boys and to improve functional speech and disruptive behavior patterns in several autistic children (Hamblin, 1969). The author reinforced "good" behavior and non-punitively discouraged "bad" behavior. Earned tokens were again used as reinforcers and were used to gain admission to movies, buy candy, playdoh, etc.

The use of other forms of reinforcers and the advantages of maximal environmental control was demonstrated by Peters and Jenkins, (1954). The patients in their experiment were administered injections of insulin in order to increase the reinforcing value of sugar. The patients were then, over a period of three months, presented with a series of graded tasks. Successful behavior was immediately followed by presenting a piece of fudge. Tasks included increasingly difficult multiple-choice and verbal reasoning problems. Reinforcement was delivered personally ny the experimenter. The insulin was discontinued after a few weeks and only social reinforcers were used, contingent upon the sclution of the problems. Results showed that, compared to a nonreinforced group, the reinforced patients had improved significantly in their social relationships.

The hospital setting was the scene of another experiment demonstrating the use of social reinforcers with a psychotic patient. Ayllon and Michael (1959) were able to reduce the delusional speech of a psychotic patient using extinction and reinforcement procedures. The patient in this instance spent a great deal of time speaking about her illigitimate child and the men who were constantly pursuing her. Little speech was related to reality. The treatment consisted of instructing ward personnel not to pay attention to any delusional talk but to reinforce (pay attention to) immediately any talk which was non-delusional. It was determined that, prior to the above procedure, 91% of the patient's talk was classified as delusional. After extinction of delusional conversation and reinforcement of non-delusional responses, the percentage was reduced to 25.

A pioneering study which applied operant principles to modify the behavior of extremely disturbed young children showed that their behavioral repertoire could be sustained and widened. (Ferster and Demyer, 1962). The activity of pressing a key was first sustained by rewarding each press with a coin (delivered by an automatic dispenser) which in turn could be used for a wide variety of reinforcers (candy vending machine, pin ball machine, a television

set, an electric train, etc.). The variety of reinforcers tended to ensure that the current deprivation levels of the child would be met. None of the children were permitted food between meals.

The results of the experiment indicated that it was possible to increase the behavioral repertoire of even the most disturbed (autistic) child by arranging rewarding contingencies for desired purposeful behavior.

The relevency of operant techniques with schizophrenic children has also been demonstrated in the development of verbal behavior. Working with two six-year-old mute schizophrenic children, Lovaas, Berberich, Perloff and Schaeffer (1966) used food to reward vocalizations. These vocalizations gradually approached sounds which the experimenter first uttered. Through this simple training program, the two children were taught to produce 26 words after only 26 days of experimentation. The experimenters conclude that their prior experience with mute schizophrenic children suggests that these changes could not have occured spontaneously.

The above studies were conducted in settings where the control of most variables was optimal. The relevence of operant techniques in relationship to behavioral deficits of a less serious nature than those typically

represented above and occuring in settings precluding optimal environmental control has also been demonstrated. The following studies represent such applicability.

B. MODIFICATION OF BEHAVIOR UNDER CONDITIONS OF LESS THAN MAXIMAL ENVIRONMENTAL CONTROL

The position that stuttering behavior is symptomatic of a core problem is an unproven one (Goldiamond 1966). An alternate viewpoint is that stuttering is a "circumscribed pattern of maladaptive behavior, acquired in the presence of certain cues, which is maintained through habit strength and/or reinforcement" (Richard and Mundy 1965). The same authors, in an experiment to support their position, used social reinforcement and points leading toward extrinsic rewards to elicit nonstuttering verbal behavior in a nine-year-old boy previously identified as a chronic stutterer. At first, the boy was encouraged through such social reinforcements as "good", "excellent", "that's fine", etc., for nonstuttering responses. Subsequently, ice cream cones and points which could be exchanged for toys were employed as reinforcers. Results showed a marked reduction in repetition errors over the twenty-three sessions of practice and reinforcement for nonstuttering. Further results reported by the authors:

> On the first sentence test day, thirty percent of the sentences contained repetition errors. By the fourth day, errors were reduced to zero for the fifty separate sentences. Only four days each were required to virtually eliminate errors on both paragraphs and stories. (Richard and Mundy, 1965 p. 271)

It should be mentioned that these results were obtained in an experimental clinic setting. An intensive effort to promote generalization by involving both parents was made. The parents eventually became the experimenters. A six month follow-up interview showed that, while emitting sixteen repetition errors on the first letter of the first test word, no errors on the remainder of the material were made. The subjective report on verbal behavior elsewhere was, however, less favorable. Much of his stuttering behavior had been reinstated at home and at school evidencing the difficulty of maintaining desired behavior under conditions precluding constant environmental control.

Modifying behaviors of handicapped children usually does not permit the deprivation of primary reinforcers. Yet, in such cases it is often necessary to strengthen weakened behaviors or to generate new behaviors to effect rehabilitation. Inability to use primary reinforcers necessitates the establishment of generalized conditioned reinforcers applicable to changing deprivational levels. The use of tokens (poker chips) was used to satisfy this need in the rehabilitation of a boy born with multiple

congenital abnormalities. Tom was a cerebral-palsied child who, though able to walk alone, refused to because of an extreme fear of falling. Unwittingly the adults in Tom's environment were reinforcing the non-walking behavior by lavishing attention on Tom for not walking. Tom enjoyed the attention dealt him. Treatment consisted of rewarding him with tokens for successive approximations to independent walking. The tokens were exchanged for toys. At the end of the first 20 minute session Tom walked three steps. At the next session, five days later, Tom walked unsupported. Treatment continued, however, until Tom learned to fall, correctly and safely, on command. This behavior was seen as being important since spastic paralysis would result in the child's falling from time to time. The physical therapist had given up trying to teach this behavior. Yet, in just four sessions, using reinforcement principles, Tom gained behaviors previously unattainable (Meyerson, Kerr and Michael 1967).

There is, of course, nothing truly original about using incentives to encourage desired behaviors. Most educators and parents use rewards as a matter of routine. They smile and nod, thus giving the visual stimulus of approval; they speak complimentary words giving verbal approval; they respond with affection, physical or

verbal, as signs of approval. Good grades, group approval, group attention, honors, medals, etc. are other examples of rewards used routinely to promote desired behavior. In spite of the general agreement that rewards are desirable and effective, in practice rewards are often "intuitive, incidental, infrequent, often trivial, unstandardized, and given with little regard to their relationship to the rewarded performance" (Ayllon and Azrin, 1968 p. 10). In short - unsystematized. Systematizing reinforcement procedures to promote positive social behavior has relevancy to delinquents since it often would appear that a history of inadequate reinforcement in this area causes trouble for youth. Studies indicating the applicability of reinforcement procedures to promoting positive social values thus has special interest to the present research.

That cooperation (a positive social value) between children can be developed, maintained and eliminated was demonstrated in an experiment by Azrin and Lindsley, (1956). Twenty children were formed into ten teams of two each. Each member of a team took positions on opposite sides of a table designed with a wire screen down the center and three holes in the top. Each child was given a stylus. If the styli were placed in opposite holes within 0.04 seconds of each other, a jelly bean fell into the cubes

of each of the children. Results showed that all teams learned to cooperate within the first 10 minutes of the experiment. The authors concluded:

> The presentation of a single reinforcing stimulus available to each member of the cooperative team is sufficient to increase the rate of cooperation. The cooperative response gradually increases in frequency when no longer reinforced (extinction). (Azrin-Lindsley, p. 100-102)

The effects of social reinforcement have also been demonstrated with isolate behavior in nursery children (Allen, Hart, Buell, Harris, Wolf, 1964) with regressed crawling (Harris, Johnston, Kelley and Wolf, 1964) and crying (Hart, Allen, Buell, Harris and Wolf, 1964).

Manipulating the environment by arranging contingencies and deprivational levels has been shown to be relatively uncomplicated in the entirely closed settings of the laboratory and hospital. Operating in settings characterized by less than total manipulatory control, while providing some problems, has also been shown to be possible. The problems increase as realistic settings of life situations removed from the hospital and/or laboratory-clinic are approached. Open settings by definition cannot control variables as effectively as more closed settings. Yet, the effectiveness of operant techniques has here too been demonstrated.

C. MODIFICATION OF BEHAVIOR UNDER CONDITIONS APPROXIMATING REAL LIFE SITUATIONS

The use of aversive control in education, including institutions for delinquents, has not been effective. In fact, the by-products of such controls may well be suspect as one of the major causes of ineffectiveness of teaching and rehabilitation. Skinner, commenting on the problem, states:

> Methods are still basically aversive. The student looks listens and answers questions (and, incidently, sometimes learns) as a gesture of avoidance or escape. ...the birch rod and cane are gone, but their place has been taken by equally effective punishments (criticism, possibly ridicule, failure) used in the same way: the students must learn or else! By-products of aversive control in education range from truancy, early dropouts, and school-vandalism to inattention, "mental fatigue", forgetting and apathy. (Skinner 1961, p. 24)

Unsystematic efforts have been made to use rewards in education but have only possibly succeeded in making things interesting and more attractive. New textbooks with beautiful covers and pictures tend in this direction but seem feeble in view of the overwhelming difficulties currently being encountered in the guidance of youth. Experimenters have been quick to realize the need for more effective systems for education and rehavilitation.

Staats and Staats (1964), commenting on reinforcement variables in school settings, recommend a procedure

involving tokens as generalized reinforcers to improve academic behaviors in school settings. Suggested as an example is the paying of perhaps 100 tokens for a period of recess which had been earned contingent upon 100 appropriate responses in class. It is suggested that, through the employment of a token system, effective use of many reinforcers that are a natural part of early school training could be made. The token system thus conceived would possibly necessitate some change in the school organization. Two rooms would be set up - one for learning activities and the other for the dispensing of reinforcers. The authors speculate that soon only behavior appropriate to the different situations would be emitted in the different rooms. The child would stay in the work room until he had accrued a given number of tokens and then go to one of the "reinforcer" rooms to receive his primary reinforcers. The child might thus have optional reinforcing activities, all of them dependent however, upon the emission of certain working behaviors.

The applicability of reinforcement procedures to reading behaviors, an area of extreme concern to education, was demonstrated in an experiment using six 4-year-olds as the subjects (Staats, Minke, Finley, Wolf and Brooks, 1964).

Mixed edibles, trinkets and tokens which could be exchanged for small plastic toys were used as reinforcers. Results indicated that the children reinforced for correct responses read well but when the treatment was changed to no-reinforcement, the reading behavior weakened. When reinforcement was reinstated, two of three children involved in the experiment decided to continue participation, and both participation and the learning of new words improved.

The history of delinquents often includes problems with school, work and interpersonal relations. An interesting study, (Richard and Duroff, 1957) while not using recognized delinquents as subjects, indicates the applicability of reinforcement in shaping behaviors. Eleven boys were selected to attend what could best be termed a therapeutic summer camp. The boys were selected because of maladaptive behaviors. The staff of the camp were trained in reinforcement procedures. Each camper was individually studied to identify deviant behaviors.

The authors, while not reporting on total outcomes, comment on the improvement of at least one camper who earlier had removed himself from school because of difficulties with his peers. Efforts by the entire staff to reinforce any social behavior on the part of the boys eventually

resulted in greater participation and interaction with other campers. By the fifth week the subject was taking part in all activities and was responding well to demands from authority figures. A three month follow-up interview showed that improvement was maintained, bringing new satisfaction to both the subject and his parents.

In a special project using 41 incarcerated teenage delinquents whose crimes ranged from car-theft to homicide, Cohen, Filipczak, Bias, Cohen and Goldiamond (unpublished) were able to produce a contingency-oriented environment which increased academic skills. Points (money) were used as generalized reinforcers. Although a deviant institutionalized population was used in this project, the experimenters consider the procedures and their relation to the results obtained to be of greater generality:

> In the first place, stemming as they do from research in the experimental analysis of behavior and environmental design, the findings are consistent with a body of data currently being obtained, using similiar procedures, with populations in other types of institutions ranging in degree of custodial control from a mental hospital (Ayllon and Azrin) to a Mid-Western college (Cohen)...ranging in population from psychotics (Goldiamond and Dyrud) and from mental retardates (Sidman), to bright college freshmen Cohen, Filipczak). The findings are also consistent with the basic procedures used in laboratory research with individuals in which promising procedures are being developed to alter their behavior in a programmed manner (Lovaas)...the procedures are currently being extended to alter human behaviors of clinical

relevance (Ferster). (Cohen, Filipczak, Bias, Cohen and Goldiamond, unpublished.)

The studies reported in the first part of this section have typically been undertaken in situations approximating a laboratory setting - that is, the experimenter has been able to control most of the variables in the environment, ranging from establishing deprivational levels in autistic children to controlling admission to the dining hall in delinquent boys. Even the classroom teacher can arrange the environment so that reinforcement principles are applied under optimal conditions in a particular class. The effectiveness, however, of established techniques of reinforcement shown to be useful in closed situations has seldom, if ever, been demonstrated in settings where all or even most of the variables are beyond the experimenter's control. Similarly, little research has been done in situations in which reality precludes establishing deprivation insofar as primary reinforcers are concerned and cannot be held back as rewards contingent upon desired behaviors.

While the above studies indicate the increasing amount of research in which pathological behavior has been modified through operant conditioning techniques,

few attempts have been made to modify the anti-social behavior of the delinquent (Slack, 1960, Schwitzgebel, 1960, schwitzgebel and Kolb, 1964). That more effective techniques are needed is reflected in the increasingly high rate of delinquency and the dismally high rate of recidivism, indicating the failure of traditional approaches. It was the purpose of the present research to determine if reinforcement techniques do, in fact, have relevancy in modifying behavior in delinquents under less than optimal conditions.

D. HYPOTHESIS

The present experiment is designed to test the basic hypothesis that there will be a significant reduction in the rate of incidents of socially negative behavior in delinquent girls who are reinforced for socially acceptable behaviors, and, similiarly, a significant increase in the rate of emission of incidents of behavior which can be described as socially positive.

CHAPTER III

METHOD

The basic objective of the present experiment has been to design a motivational environment in a school for delinquent girls using operant reinforcement techniques. The central assumption of this process is that behavior is greatly influenced by the changes it produces in the environment i.e., the behavior acts or operates upon the environment to generate consequences. Thus, socially acceptable behavior of delinquent girls in the present experiment will act upon the environment to produce rewards or reinforcements.

Deprivation of reinforcers of a primary nature is especially effective in promoting desired behaviors. The subjects of the present experiment, however, were not deprived of primary reinforcers, and since it was not possible, for social and administrative reasons, to place them under such deprivation, it was necessary to find reinforcers of a powerful and continuing effectiveness which would have applicability to the various deprivation levels of various subjects. The use of tokens was chosen to fulfill this need.

A. TOKENS

Tokens were seen as ideal conditioned reinforcers because they can be easily dispensed and delivered immediately, contingent upon the performance of acts deemed socially acceptable. They are non-satiating or low in satiation so that many can be dispensed in a short period of time. Especially important is the fact that tokens are appropriate for many different deprivations which may exist in the subject and they can be used in a variety of situations. Other advantages are:

1. The number of tokens can bear a simple quantative relation to the amount of reinforcement.
2. The tokens are portable and can be in the subject's possession even when he is in a situation far removed from that in which the tokens were earned.
3. No maximum exists in the number of tokens a subject may earn.
4. Tokens can be used directly for reinforcers.
5. Tokens are durable and can be continuously present during the delay.
6. The physical characteristics of the token can be standardized.
7. Tokens bridge the delay between the desired response and the delivery of reinforcement, thereby maintaining the response in strength.
8. Tokens allow the response to be reinforced anytime. (Ayllon, Azrin, 1968)

In short, tokens "provide a distinctive and tangible stimulus event to bridge any delay between the desired response and the delivery of the reinforcer" (Ayllon and Azrin, 1968, p.77).

B. DESIGN

The design employed in the present research is an example of the procedure which Cambell and Stanley (1963) refer to as the pre-test - post-test design. If R represents randomized groups and X represents the treatment, and O, represents post-test, and O pre-test, the form of the design is as follows:

O	X	O,	(Experimental Group)
O		O,	(Control Group)

The process of randomization served to control for possible biases between experimental and control groups. Base level rates of behavior were accumulated before the experiment began.

C. LIMITATIONS

There are certain limitations imposed on the design of the experiment. Ideally, more precision would have resulted if the experimental and control groups had been totally separated with no opportunity to interact (the interaction of groups was however, contained to some degree by keeping groups separate in cottages and classes). Such controls, however, are more feasible in laboratory settings than in field experiments where administrative routine

and normal life style are not readily manipulable. The general thrust of the present experiment was to test applicability of operant procedures in a setting precluding any special procedures in any way facilitating to the technique involved-i.e., no deprivation of any nature was introduced into the environment and no extraordinary management of the subjects, with the exception of rewarding the experimental group for desired behaviors, was possible. The nature of the experiment also required members of the staff to be the raters, probably precluding optimal reliability. Further, one cannot discount the influences of the Hawthorne effect (Maier, 1955) in a study of this nature. The very attention applied to the subjects who were identified as being "special" may have served to promote changes much as the placebo administered by the physician serves where more exact science fails.

D. SETTING

The Gilmary School for Girls, located approximately 20 miles west of Pittsburgh, Pennsylvania, was the setting for the experiment. The school is situated in a rural location of approximatly 80 acres. The school is owned and operated by the Sisters of the Good Shepherd. The campus consists of four cottages capable of accomodating a total

of 100 girls, although this maximum is seldom reached. A school, chapel and cafeteria are provided on campus. There are no physical restraints such as fences or bars in or around the institution.

E. SUBJECTS

Girls, ranging from 14 through 18 years of age, who have been committed to this residential institution have been judged to have failed in adjusting to the norms of society or to have engaged in behavior seen to be deviant. The behavior of the subjects has been what one might consider typical delinquent behavior: fighting, swearing, uncooperativeness and reluctance to do assigned tasks are a few examples of daily-occuring undesirable activities. Various techniques designed to contain such behaviors, ranging from assigning additional chores to actually locking up the offender, are routinely applied. Nothing attempted, however, seems to have real impact in changing behaviors over any period of time.

F. EXPERIMENTAL AND CONTROL GROUPS

Every girl in the institution was placed in either the experimental or the control group. Thirty girls were randomely selected to be in the experimental group and

thirty girls were randomely assigned to the control group. No pre-selection criteria of any nature were used. The experimental group was housed in two cottages with 15 girls in each. These were known as Cottages A and B. The control group was housed in two similar cottages, identified as C and D.

G. TREATMENT

The treatment consisted of dispensing tokens to members of the experimental group for any behaviors deemed socially acceptable. These tokens, actually red and blue poker chips with holes drilled through, were redeemable for a wide variety of reinforcers. The color of the token represented its worth: red chips were the lowest unit whereas blue chips were worth 10 red tokens. No reference to the dollar monetary system in use on the "outside" was made in order to manipulate the cost of reinforcers without external referents - a piece of candy, not too readily available in the institution cost 5 tokens even though its worth on the "outside" might only be 2 cents, for example. Subjects were able to accumulate tokens or spend them as they earned them.

H. REINFORCERS

A canteen or store to contain the reinforcers was

especially established for this experiment. Every effort was made to provide reinforcers especially desirable to adolescent girls. Following is a list of some of the reinforcers contained in the store:

Cigarettes	Soda Pop
Candy (many Varieties)	Popsicles
Stockings	Coffee
Perfumes	Hair Spray
Books	Combs
Rugs	Sweatshirts
Shampoo	Deodorant
Purses	Cosmetics
Belts	Jewelry
	Orange Drink

Other reinforcers included were:

Dinner off Campus
Drive-in theatres - located close to the institution.
Quiet Lounge time - 15 minutes of uninterrupted time alone in a special lounge. Television, radio and magazines were provided in this lounge.

I. MILIEU

The experiment was conducted during a eight week annual summer recess from the regular activities of the school. A program designed to counter-act the effects of cultural deprivation usually associated with juvenile delinquency was in operation during this period. The program exposed the girls to many experiences they would not normally encounter such as horse-back riding, picnics, concerts, cultural films and events. Special classes in Home Economics (foods and sewing), Physical Education,

Typing and Art also were offered.

J. STAFF

The staff most closely interacting with the subjects were as follows:

Four Cottage Supervisors---Religious (Order of the Sacred Heart)

Art Teacher----------Religious (Order of St. Francis)

Sewing Teacher----------Religious (Order of the Sacred Heart)

Physical Education Teacher-Female lay teacher with 20 years teaching experience.

Home Economics Teacher-----Female lay teacher who is also certified as a Counselor.

Business Teacher----------Male lay teacher with 8 years teaching experience.

While the above list indicates those who were most involved with the subjects for recording purposes, it should be emphasized that all institutional personnel were free to reward socially acceptable behavior. For example, the cook, the custodian, the priest, the counselor and the staff psychologist also dispensed tokens.

Before beginning the experiment, all institutional personnel interacting with the subjects were instructed, in groups and individually, as to the objectives of the experiment and the role they were to play in it. Emphasized was the need to reward (give tokens) any "good" behavior

immediately and to ignore wherever possible negative behavior. Personnel were cautioned to dispense tokens only to subjects in the experimental group and to "handle" members of the control group in the usual manner. Subjects in the experimental group were required to wear an attractive red ribbon on their left shoulders to aid personnel in initially identifying those who were eligible to receive tokens. The tokens had holes drilled through them to discourage counterfeiting and to permit the girls to string tokens together, as they earned them during the day, into bracelets and necklaces. This visual display of earned tokens served as stimuli for subjects and institutional personnel to offer social reinforcement.

K. IDENTIFICATION OF SOCIALLY NEGATIVE BEHAVIORS

A pioneering investigation in the classification of behavioral problems of children referred to a child guidance clinic was conducted by Hewitt and Jenkins (1946). Ninety-four descriptive phrases about behavior were rated as to their presence or absence in 500 case records. Elimination of items infrequently noted or thought to be theoretically unimportant resulted in the retention of forty-five phrases. These items were further analyzed and intercorrelated to form clusters or syndromes of traits. Three behavioral syndromes were thus delineated: Unsocialized Aggressive, Socialized Delinquent, and Overinhibited. An

extension of this study to adjudicated delinquents was made by Jenkins and Glickman (1947). Three hundred institutionalized delinquents were selected as the sample. Ratings showed that two thirds of the delinquents rated could be arbitrarily classified as belonging to one or more of the three categories. Fifty-six cases met the criteria to be called unsocialized; seventy-eight cases were classified as socialized; and sixty-three cases were rated as showing symptoms beyond what had been classified as "overinhibited" in the original study. This group was classified as disturbed. Twenty-five behaviors are presented by the authors as being representative of the kinds of behaviors classified as being present in the repertoires of most delinquents. These behavior traits are:

Impudence
Bullying
Irritability
Obscenity
Feels persecuted
Temper Tantrums
Disobedience
Projection
Craftiness
Overaggressive
Sullenness
Sex Manifestations
Active Homosexuality
Undesirable Companions
Lonesomeness
Emotional Immaturity
Self Consciousness

Extreme Untidiness
Feeding Difficulties
Carelessness
Overdependence
Fears and Phobias
Emotional Instability
Oddities of Behavior
Nostalgia

The behavioral traits listed in the above study have, for the most part, served as the basis of observation in the present study. However, not all the listed traits have applicability to the realities of the situation at Gilmary School. Only those traits reflecting overt behavior permitting observation by staff members would seem appropriate to the experiment. Thus over-aggressiveness, bullying, temper tantrums, etc., may be observed and recorded whereas nostalgia, lonesomeness, sex manifestations, etc. were felt likely to be beyond the capibilities of the staff to observe and interpret for recording purposes. Therefore seven traits were retained from the list as having appropriateness for the design of this experiment. These are:

Fighting
Swearing
Bullying
Irritability
Temper Tantrums
Sullenness
Untidiness

Individual and group conferences with staff members who had lived with the subjects over long periods of time were conducted to determine additional behaviors peculiar to the institution which were seen as irritable and/or socially unacceptable. These behaviors were added to the list as having relevance. They are:

Loud Talk
Impudence
Stealing
Uncooperativeness
Callousness
Doing Charges
Tardy to Class

Each teacher and cottage supervisor(referred to as "Mother" by the subjects) submitted daily reports reflecting the rate of incidence of each of these behaviors for each girl in both experimental and control groups. These incidence-rate sheets also provided for the reporting of socially acceptable behaviors. Data was compiled weekly on a weekly incidence rate sheet. The use of daily reports for each subject also provided opportunities to observe cases especially resistant to behavioral modification. Special schedules of reinforcement were planned in these instances.

L. IDENTIFICATION OF SOCIALLY POSITIVE BEHAVIORS

Attempting to categorize positive behaviors presents some problems of definition. Fighting, swearing, bullying, etc. have been identified as socially negative behaviors. It follows that the obverse of these kinds of behaviors,

i.e. not fighting, not swearing, and not bullying would be socially positive but difficult to reward except where it can be recognized that overt efforts have been made to avoid entering into such negative behaviors. Further, "neutral" behaviors such as praying, reading, polite conversation, etc., while socially acceptable, would usually not be rewarded.

The obverse of the negative behaviors previously identified and as outlined above served, for the purposes of the present research, as socially positive behavior. Included also were behaviors volunteered by the staff during indoctrination and training sessions. Illustrative of these behaviors are:

Cooperation in Class
Silence in the Food Serving Line
Minimal Noise in the Dish Room
Volunteering for Extra Chores (School and Cottage)
Volunteering for Extra Duties in the Cafeteria
Keeping the Campus Clean

A free-comment section was included on rating sheets providing opportunities to record and tally socially positive incidents.

M. ANALYSIS OF DATA

Rates of incidence in the various negative behavior categories were tallied separately for each experimental and control group subject. Separate tallies for classroom and cottage behaviors were also made. Chi square was employed

to test for significant differences between groups. The differences between groups was further demonstrated through the use of graphs.

Data accumulated separately for each variable was evaluated in several ways. Report rates for the entire experiment were first analysed and compared for the groups. Data for each cottage was then separately evaluated to determine if negative behaviors tended to decrease over time. A significant decrease of this nature would be in support of the hypothesis and conceivably indicate treatment effect. A declining report trend would also tend to indicate initial equality of cottages as opposed to cottages whose rates of performance were low to begin with. Similiar analysis were made for group performances for the first half of the experiment. Again the objective was to determine if differences between the groups were significantly apparent in relation to time progression. Such differences, if in favor of the experimental group, would tend to indicate trends in support of the hypothesis.

The analyses were made, therefore, in an attempt to demonstrate a gradual drawing apart of experimental groups and cottages from control groups ard cottages in the number of negative behaviors reported indicating treatment effect.

CHAPTER IV

RESULTS

The first group of sub-hypothesis (one thru twelve) related to behavior differences and changes in the school setting.

School.

Tardy. The first hypothesis predicted that there would be a significant difference between groups relative to punctuality in getting to class. The variable "Tardy" was evaluated by comparing frequency of tardy behavior in the groups and computing chi square for reported incidence rates for the entire experiment. The results of this evaluation are reported in Table 1. These data are graphically presented in figure 1. Also evaluated was the separate performance of each cottage for the first half of the experiment. Chi square was determined and the results are reported in Table 2. Further evaluation was made of the performance of the experimental group as compared to the control group for the first half of the experiment. These results are indicated in Table 3. All cells of less than twenty frequencies were corrected by the Yates' correction formula (Koenker, 1961).

TABLE 1

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	56	68.5	4.56**
Control	81	68.5	

* P < .01 ** P < .05

Figure 1

DAILY INCIDENCE RATE FOR TARDY BEHAVIOR

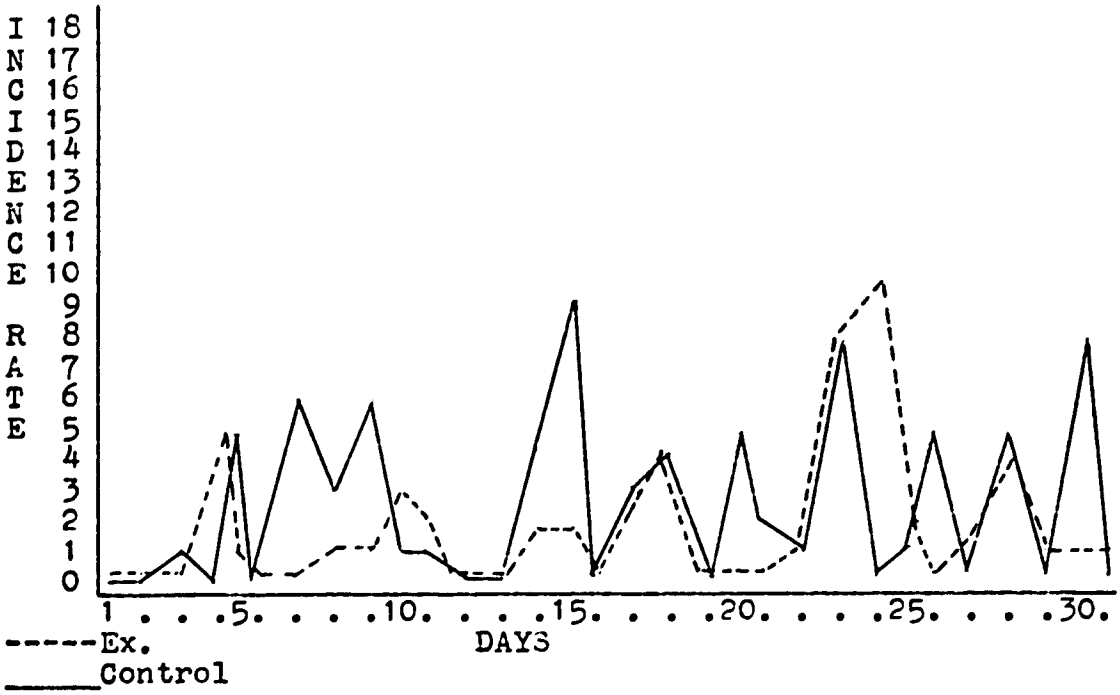

Table 2

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	13	16.5	20	16.5	1.00
B	4	11.5	19	11.5	8.52*
C	27	20	13	20	4.22**
D	11	20.5	30	20.5	7.90*

* P < .01
** P < .05

Table 3

EXPERIMENTAL AND CONTROL GROUP RATES FOR TARDY BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	17	27.5	7.28*	39	41	.186
Control	38	27.5		43	41	

* P < .01
** P < .05

Swearing. The second hypothesis predicted that swearing behavior would be significantly more frequent in the control group than in the experimental group. Data were evaluated by chi square as indicated in Table 4 below. These data are also graphically presented in Figure 2. Further evaluation of the performance of separate cottages was conducted for the first half of the experiment and chi square computed with results as indicated in Table 5 below. The experimental group was also compared to the control group for the first half of the experiment resulting in the chi squares indicated in Table 6.

TABLE 4

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	8	13	3.12
Control	18	13	

*P $\angle$.01
**P $\angle$.05

Figure 2

DAILY INCIDENCE RATE FOR SWEARING BEHAVIOR

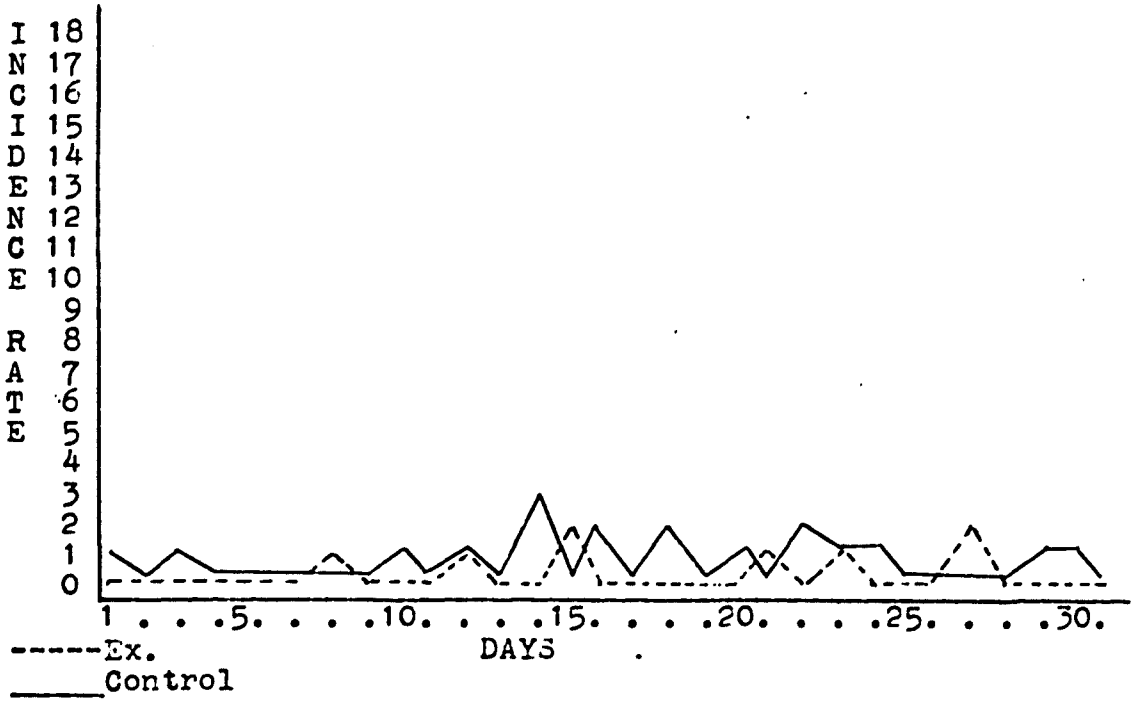

Table 5

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	1	1	1	1	0.00
B	3	3	3	3	0.00
C	3	5.5	8	5.5	1.46
D	4	5.5	3	5.5	0.00

* P < .01
** P < .05

Table 6

EXPERIMENTAL AND CONTROL GROUP RATES FOR SWEARING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	4	5.5	0.36	4	7.5	2.4
Control	7	5.5		11	7.5	

* P < .01
** P < .05

Bullying. The third hypothesis predicted that significantly more bullying behavior would be reported for the control group than for the experimental group. Data were accumulated and reported in several ways. Table 7 below indicated results of group comparisons for the entire experiment. These results are also graphically presented in figure 3. Further evaluation of separate cottage performance was made for the first half of the experiment with results as indicated in Table 8 below. Also evaluated was the performance of experimental and control groups for the first half of the experiment. These results are indicated in Table 9.

TABLE 7

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	3	5	1.60
Control	7	5	

* P < .01
** P < .05

Figure 3

DAILY INCIDENCE RATE FOR BULLYING BEHAVIOR

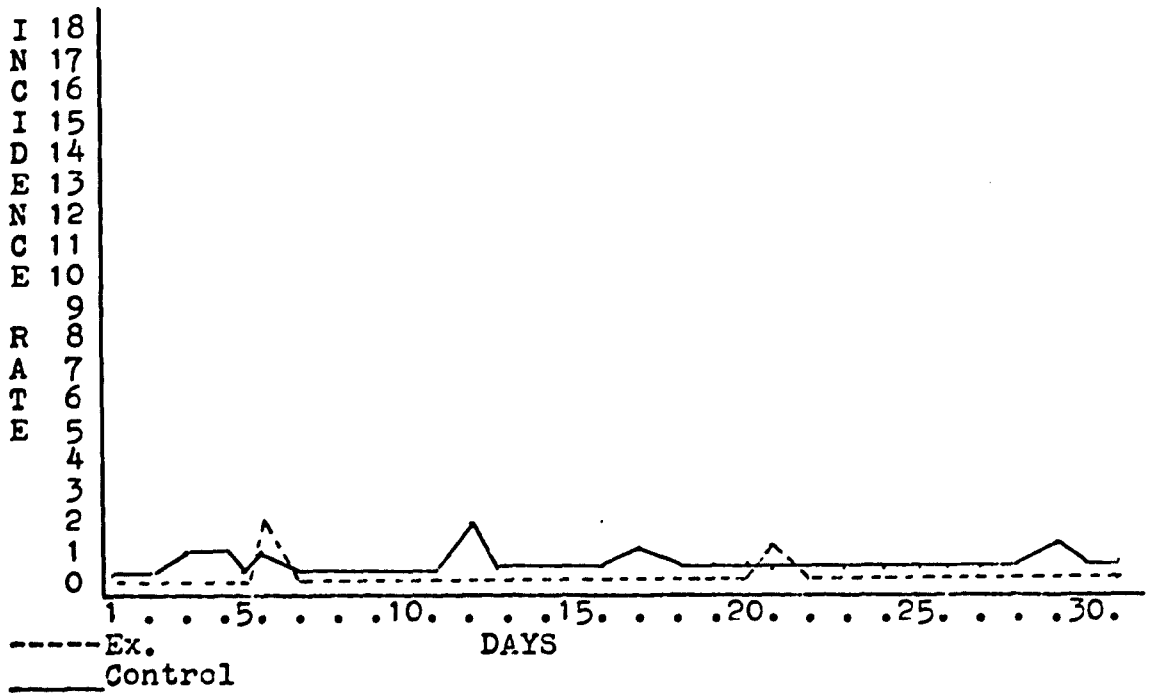

Table 8

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	.5	1	.5	0.00
B	2	1	0	1	.50
C	2	2	2	2	0.00
D	3	1.5	0	1.5	1.34

* P < .01
** P < .05

Table 9

EXPERIMENTAL AND CONTROL GROUP RATES FOR BULLYING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	2	3.5	.572	1	1.5	0.00
Control	5	3.5		2	1.5	

* P < .01
** P < .05

Loud Talk. The fourth hypothesis predicted significantly more incidents of inappropriate loud talk would be reported for the control group than for the experimental group. Table 10 below reflects the results of accumulated data for the entire experiment. Figure 4 below illustrates these data graphically. Further evaluation was conducted of separate cottage performance for the first part of the experiment. Table 11 below reflects the results of this evaluation. Experimental group performance was further compared with control group performance for the first half of the experiment. Results of this comparison are shown in Table 12 below.

TABLE 10

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	75	108	20.0*
Control	141	108	

* P < .01
** P < .05

Figure 4

DAILY INCIDENCE RATE FOR LOUD TALK BEHAVIOR

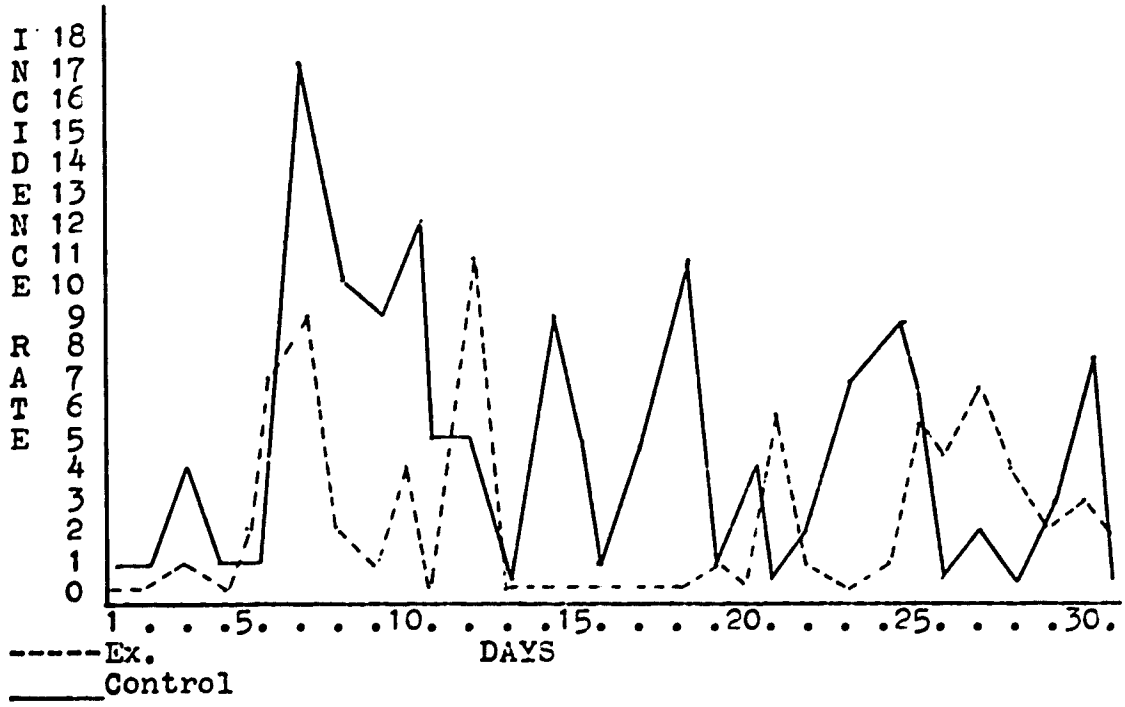

Table 11

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	6	11	16	11	3.68
B	31	26.5	22	26.5	1.54
C	64	47.5	31	47.5	11.46*
D	17	23	29	23	2.64

* P < .01
** P < .05

Table 12

EXPERIMENTAL AND CONTROL GROUP RATES FOR LOUD TALK BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	37	59	16.40*	38	49	4.94**
Control	81	59		60	49	

* P < .01
** P < .05

Impudence. The fifth hypothesis predicted that a significant difference between groups would exist in the reporting of impudent behavior. Data was accumulated and chi square computed as reflected in Table 13 below. These data, accumulated for the entire experiment, are also graphically presented in Figure 5. Performance of individual cottages was evaluated for the first half of the experiment. These results are reported in Table 14 below. Further evaluation was made by comparing groups for the first half of the experiment. Results of this evaluation are reflected in Table 15 below.

TABLE 13

GROUP COMPARISON- ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	17	38.5	24.0*
Control	60	38.5	

* P < .01
** P < .05

Figure 5

DAILY INCIDENCE RATE FOR IMPUDENT BEHAVIOR

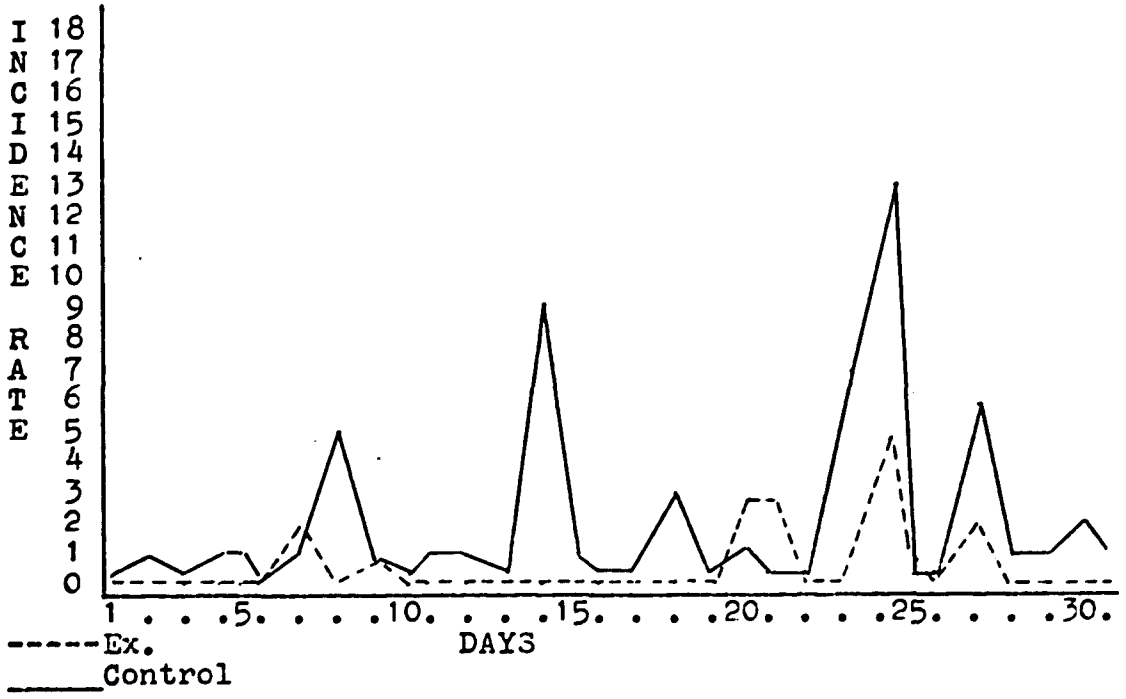

Table 14

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	3	6	3	4.16**
B	3	5.5	8	5.5	1.46
C	23	22.5	22	22.5	.022
D	2	7.5	13	7.5	6.66*

* P < .01
** P < .05

Table 15

EXPERIMENTAL AND CONTROL GROUP RATES FOR IMPUDENT BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	3	14	15.76*	14	24.5	9.0*
Control	25	14		35	24.5	

* P < .01
** P < .05

Irritable. The sixth hypothesis predicted there would be a significantly higher rate of irritable behavior reported for the control group than for the experimental group. Accumulated data and chi square are reported for the groups as indicated in Table 16 below, and are also graphically represented in Figure 6. Rates of performance for the first half of the experiment were also gathered for individual cottages. Evaluation of these results are reported in Table 17 below. Also evaluated was the performance of experimental and control groups for the first half of the experiment. These results are reported in Table 18.

TABLE 16

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	17	38	23.2*
Control	59	38	

* P < .01
** P < .05

Figure 6

DAILY INCIDENCE RATE FOR IRRITABLE BEHAVIOR

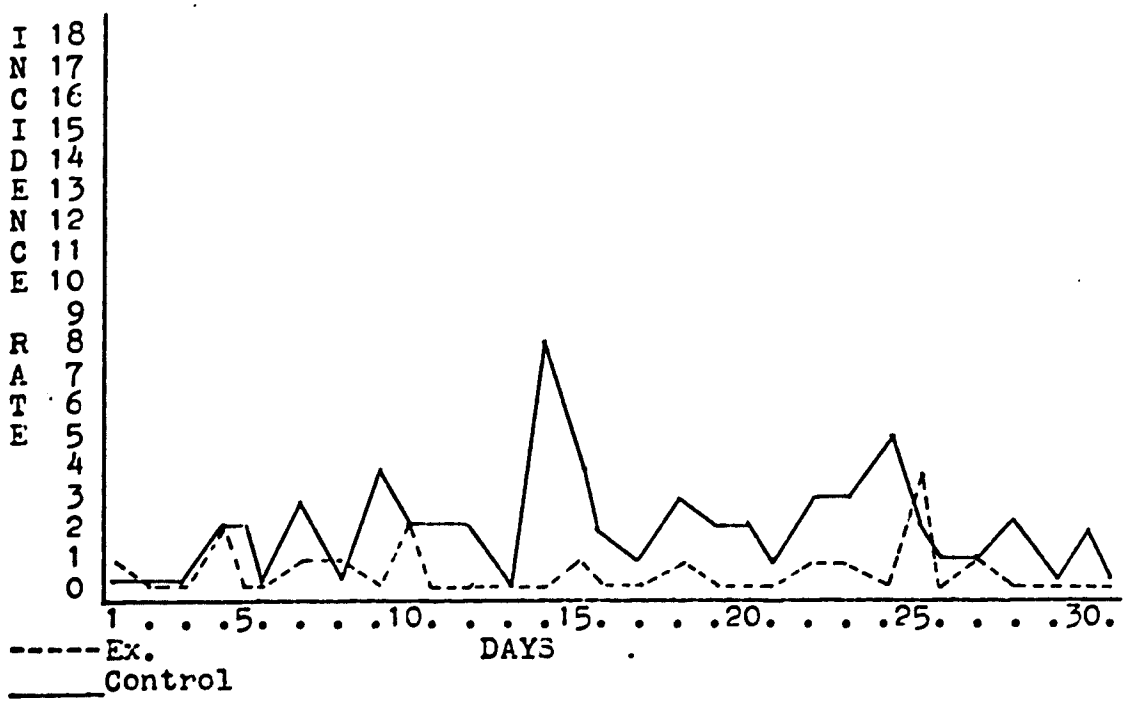

Table 17

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	4	4.5	5	4.5	0.00
B	5	4	3	4	.12
C	17	16.5	16	16.5	0.00
D	13	13	13	13	0.00

* P < .01
** P < .05

Table 18

EXPERIMENTAL AND CONTROL GROUP RATES FOR IRRITABLE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	9	19.5	10.23*	8	18.5	10.80*
Control	30	19.5		29	18.5	

* P < .01
** P < .05

Uncooperative. The seventh hypothesis predicted there would be significantly more reported incidents of uncooperative behavior for the control group than for the experimental group. Data was evaluated and chi square computed for experimental and control groups with results as reported in Table 19 below. These data are also graphically presented in figure 7. Further evaluation was made of the performance of separate cottages for the first half of the experiment. These results are reported in Table 20 below. The performance of the experimental and control groups was also evaluated for the first part of the experiment. These results are reported in Table 21 below.

TABLE 19

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	65	188.5	161.8*
Control	312	188.5	

* P < .01
** P < .05

Figure 7

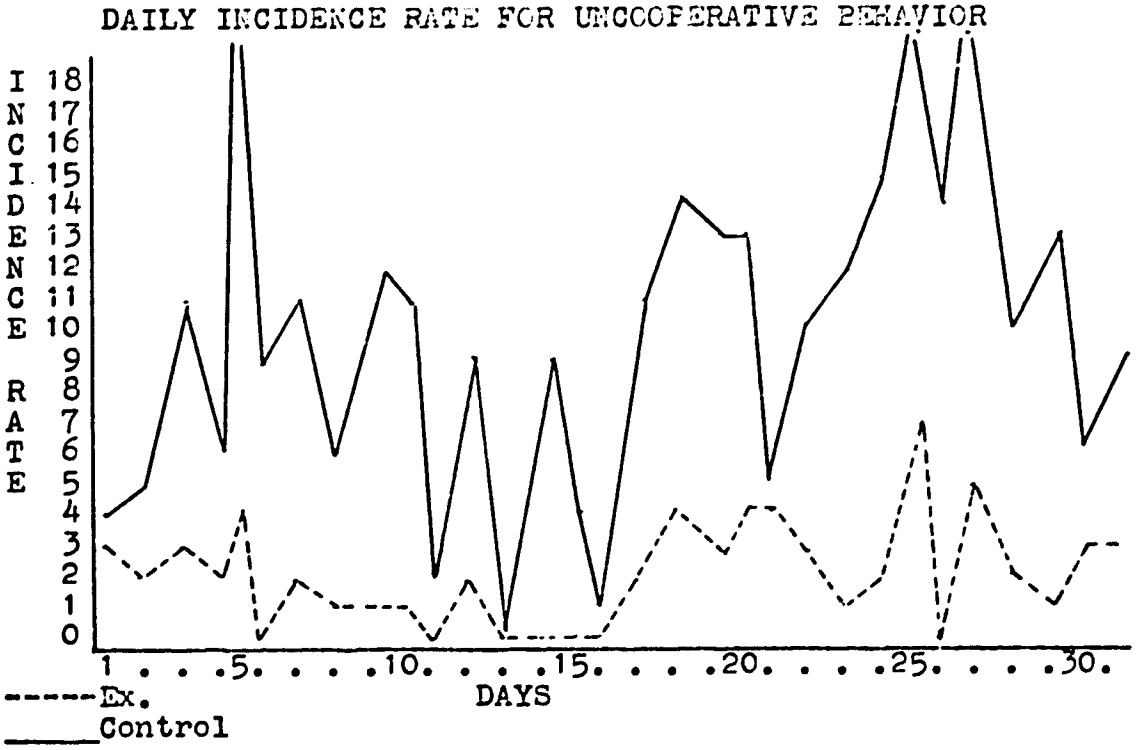

Table 20

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	5	11.5	18	11.5	6.26**
B	16	21	26	21	1.92
C	88	105	122	105	5.50**
D	37	51	65	51	7.68*

* P < .01
** P < .05

Table 21

EXPERIMENTAL AND CONTROL GROUP RATES FOR UNCOOPERATIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	21	73	76.52*	44	115.5	88.52*
Control	125	73		187	115.5	

* P < .01
** P < .05

Temper Tantrums. The eighth hypothesis predicted a significant difference between groups would be reflected in reports of behavior catagorized as temper tantrums. Accumulated data was evaluated and the results are reported in Table 22 and are further graphically presented in Figure 8 below. Reports of temper tantrum behavior were also evaluated for each cottage for the first half of the experiment. These results are reflected in Table 23. Further evaluation was made of experimental and control groups for the first half of the experiment. Table 24 below reflects these results.

TABLE 22

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	6	18.5	17.8*
Control	31	18.5	

* P < .01
** P < .05

Figure 8

DAILY INCIDENCE RATE FOR TEMPER TANTRUM BEHAVIOR

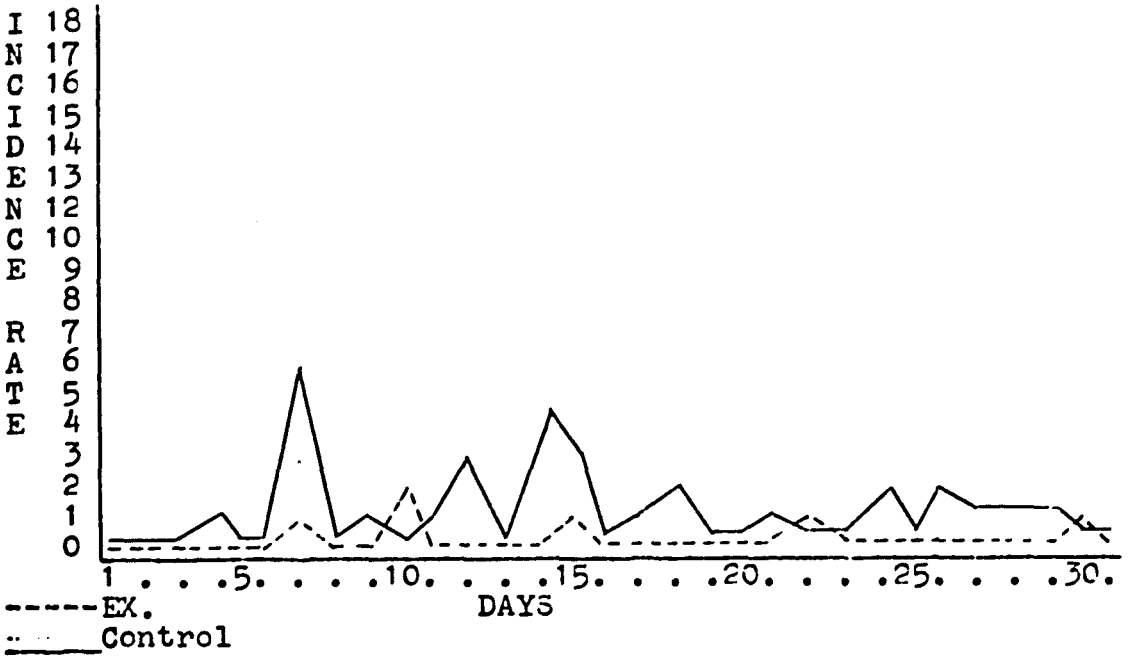

Table 23

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	.5	1	.5	0.00
B	4	2.5	1	2.5	.80
C	13	11	9	11	.41
D	7	4.5	2	4.5	1.78

* P < .01
** P < .05

Table 24

EXPERIMENTAL AND CONTROL GROUP RATES FOR TEMPER TANTRUM BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	4	12	9.38*	2	6.5	4.92**
Control	20	12		11	6.5	

* P < .01
** P < .05

Callous. The ninth hypothesis predicted a significant difference between groups would exist in reported rates of behavior seen to be callous. Reported rates for the groups were evaluated. The results of this evaluation are reported in Table 25 and are further graphically presented in Figure 9 below. Rates of performance of separate cottages were evaluated for the first half of the experiment and results are reported in Table 26. Experimental and control groups were further compared for the first half of the experiment and these results are shown in Table 27 below.

TABLE 25

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	1	3.5	1.78
Control	6	3.5	

* P < .01
** P < .05

Figure 9

DAILY INCIDENCE RATE FOR CALLOUS BEHAVIOR

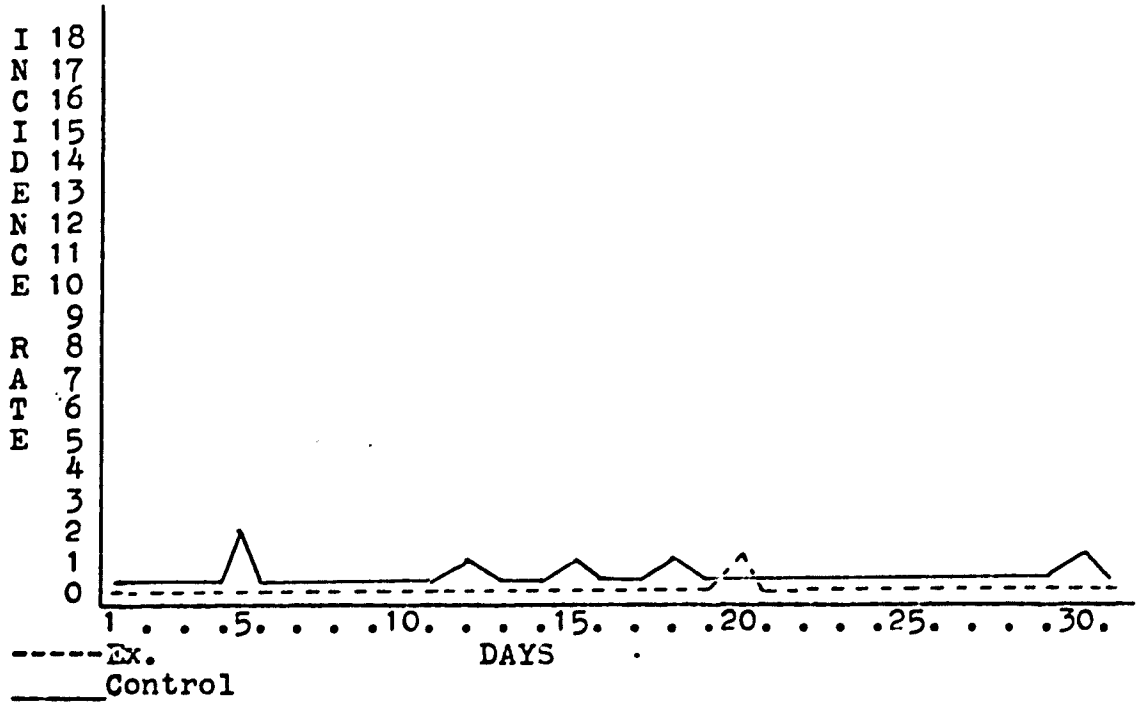

Table 26

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	0	0	0	0.00
B	0	.5	1	.5	0.00
C	2	1.5	1	1.5	0.00
D	2	1.5	1	1.5	0.00

* P < .01
** P < .05

Table 27

EXPERIMENTAL AND CONTROL GROUP RATES FOR CALLOUS BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	0	2	2.26	1	1.5	0.00
Control	4	2		2	1.5	

* P < .01
** P < .05

Sullen. The tenth hypothesis predicted there would be significantly more sullen behavior reported for the control group than for the experimental group. Results of evaluated data accumulated for the entire experiment are reported in Table 28 and graphically represented in Figure 10 below. Further evaluation was made of the performance of each separate cottage for the first half of the experiment. Results of this evaluation are reported in Table 29. Control group and the experimental group were compared for the first half of the experiment. These results are reported in Table 30.

TABLE 28

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	12	24.5	11.76*
Control	37	24.5	

* P $\leq$ .01
** P $\leq$ .05

Figure 10

DAILY INCIDENCE RATE FOR SULLEN BEHAVIOR

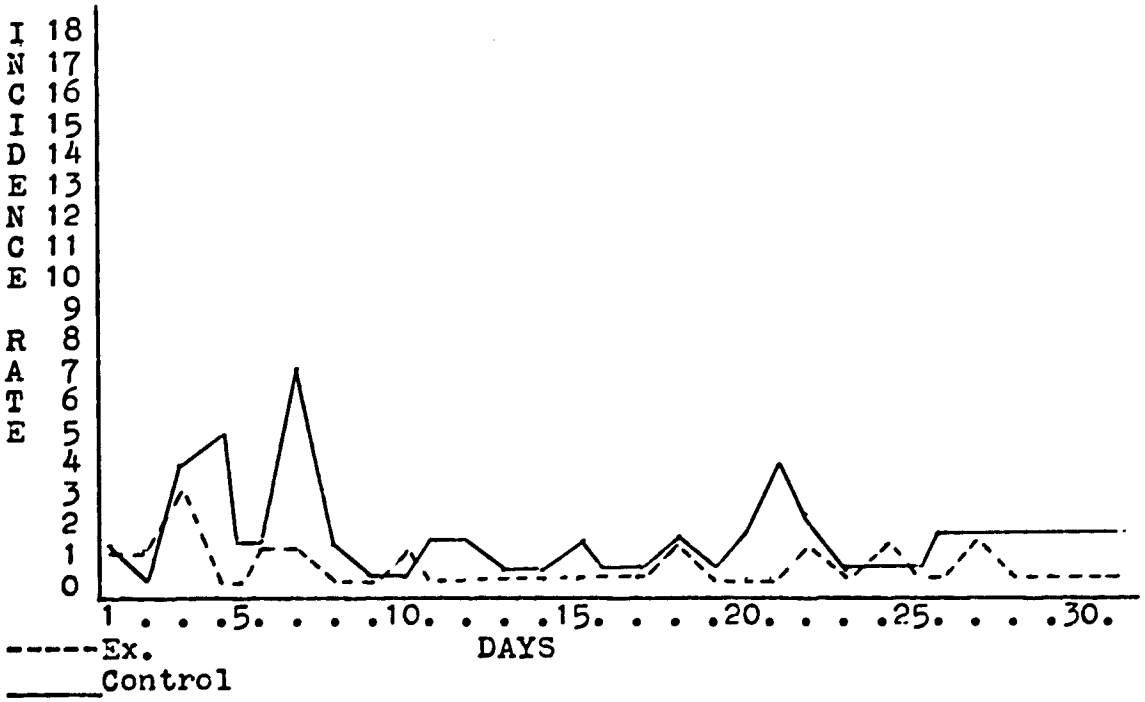

Table 29

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	0	0	0	0.00
B	8	6	4	6	.75
C	8	10.5	13	10.5	.76
D	15	8	1	8	10.56*

* P < .01
** P < .05

Table 30

EXPERIMENTAL AND CONTROL GROUP RATES FOR SULLEN BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	8	15.5	6.32**	4	9	4.50*
Control	23	15.5		14	9	

* P < .01
** P < .05

Positive Comments. The eleventh hypothesis predicted there would be a significant difference between groups in the number of positive comments made. Chi square was computed for the groups as reported in Table 31 below. These data are also graphically presented in Figure 11 below. Further comparison was made by evaluating the performance of each cottage for the first half of the experiment. Table 32 reflects these results. Experimental and control group performances were also evaluated for the first half of the experiment with results as reported in Table 33 below.

TABLE 31

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	227	145.5	91.30*
Control	64	145.5	

* P < .01
** P < .05

Figure 11

DAILY INCIDENCE RATE FOR POSITIVE BEHAVIOR

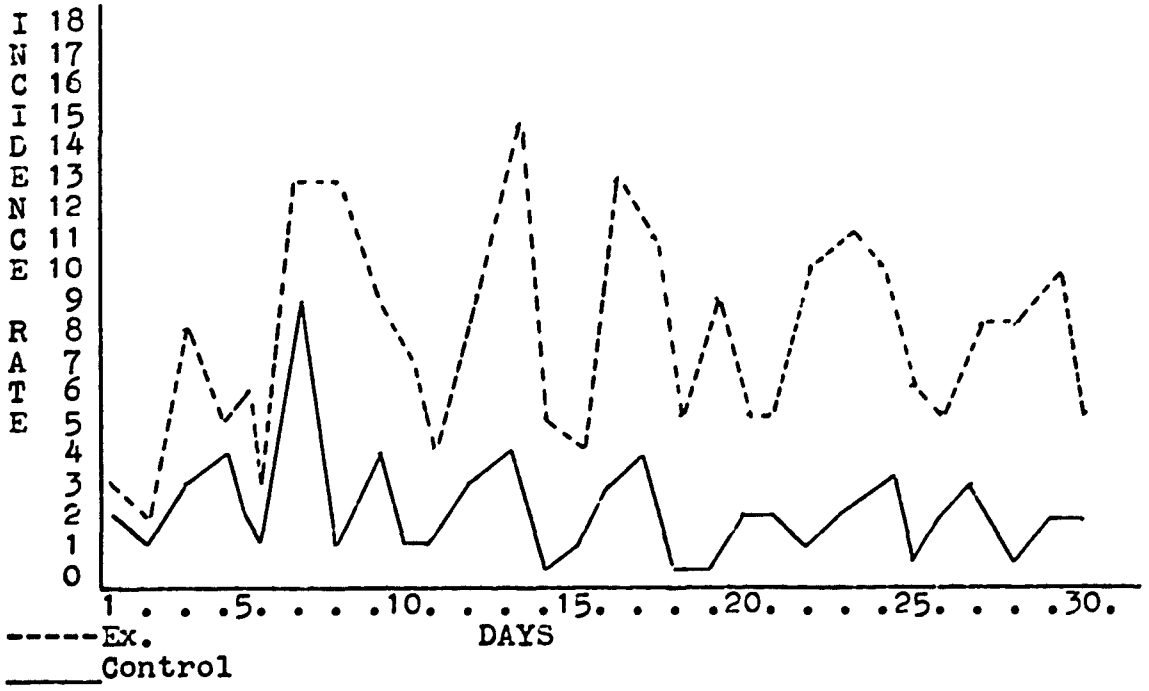

Table 32

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	77	68.5	60	68.5	2.10
B	36	45	54	45	3.60
C	17	16.5	16	16.5	0.00
D	22	15.5	9	15.5	4.64**

* P < .01
** P < .05

Table 33

EXPERIMENTAL AND CONTROL GROUP RATES FOR POSITIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	113	76	36.28*	114	69.5	56.98*
Control	39	76		25	69.5	

* P < .01
** P < .05

Negative Comments. The twelfth hypothesis predicted there would be significantly more negative behaviors reported for the control group than for the experimental group. Here again the data were evaluated in several different ways. The rate of incidence of the groups was compared for the entire experiment and these results are graphically presented in Figure 12. The performance of each cottage was separately evaluated for the first half of the experiment. These results are reported in Table 35. The performance between groups and for the first half of the experiment was also evaluated and these results are reported in Table 36.

TABLE 34

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	34	88	66.2*
Control	142	88	

* P < .01
** P < .05

Figure 12

DAILY INCIDENCE RATE FOR NEGATIVE BEHAVIOR

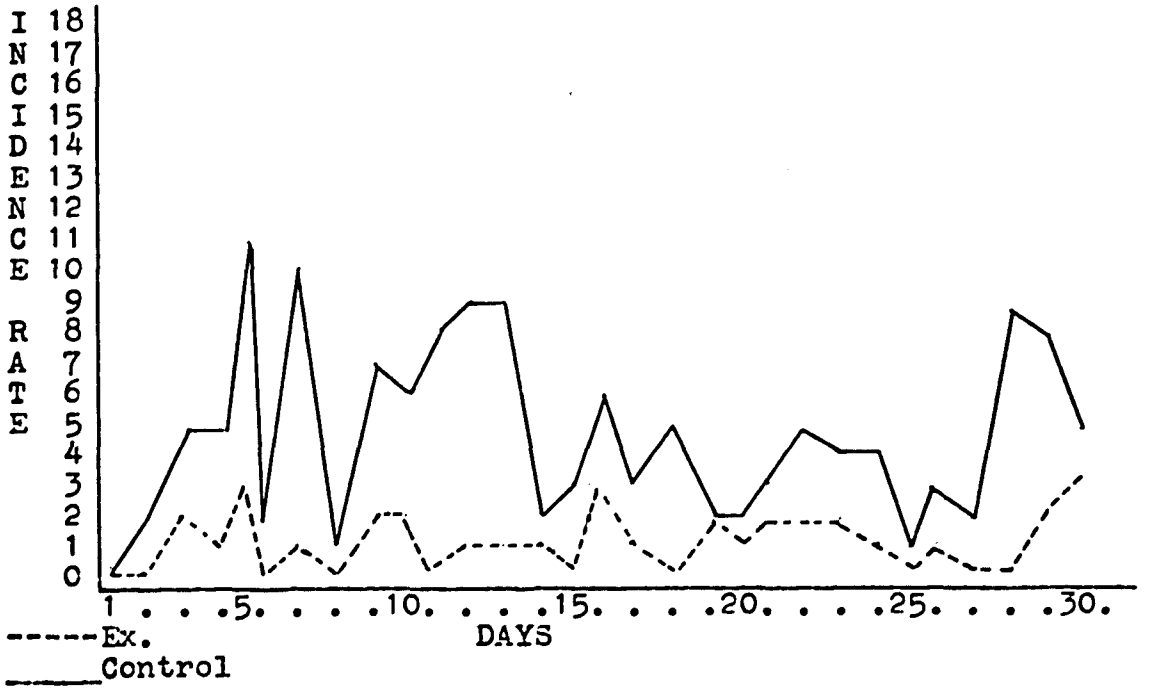

Table 35

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

Group	Obs	Exp	Obs	Exp	X^2
A	7	10	13	10	1.80
B	7	7	7	7	0.00
C	50	49.5	49	49.5	0.00
D	30	21.5	13	21.5	5.96**

* P < .01
** P < .05

Table 36

EXPERIMENTAL AND CONTROL GROUP RATES FOR NEGATIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	14	47	44.94*	20	41	21.52*
Control	80	47		62	41	

* P < .01
** P < .05

The second group of sub-hypothesis (thirteen thru twenty seven) related to behavior differences and changes in the cottage setting.

Cottages.

Fighting. The thirteenth hypothesis predicted there would be significantly more reported incidents of fighting behavior in the cottages for the control group than for the experimental group. Data were accumulated separately for behavior in the cottages and evaluated in several ways. Experimental and control groups were compared and chi square computed for data reflecting behavior reported for the entire experiment. These results are reflected in Table 37 and are graphically presented in figure 13 below. Also compared was the rate of incidence of fighting behavior for each cottage for the first half of the experiment. Table 38 indicated these results. Further comparison was made of the experimental and control groups for the first half of the experiment. Table 39 below reflects these results.

TABLE 37

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	2	49	87.78*
Control	96	49	

* P < .01
** P < .05

Figure 13

DAILY INCIDENCE RATE FOR FIGHTING BEHAVIOR

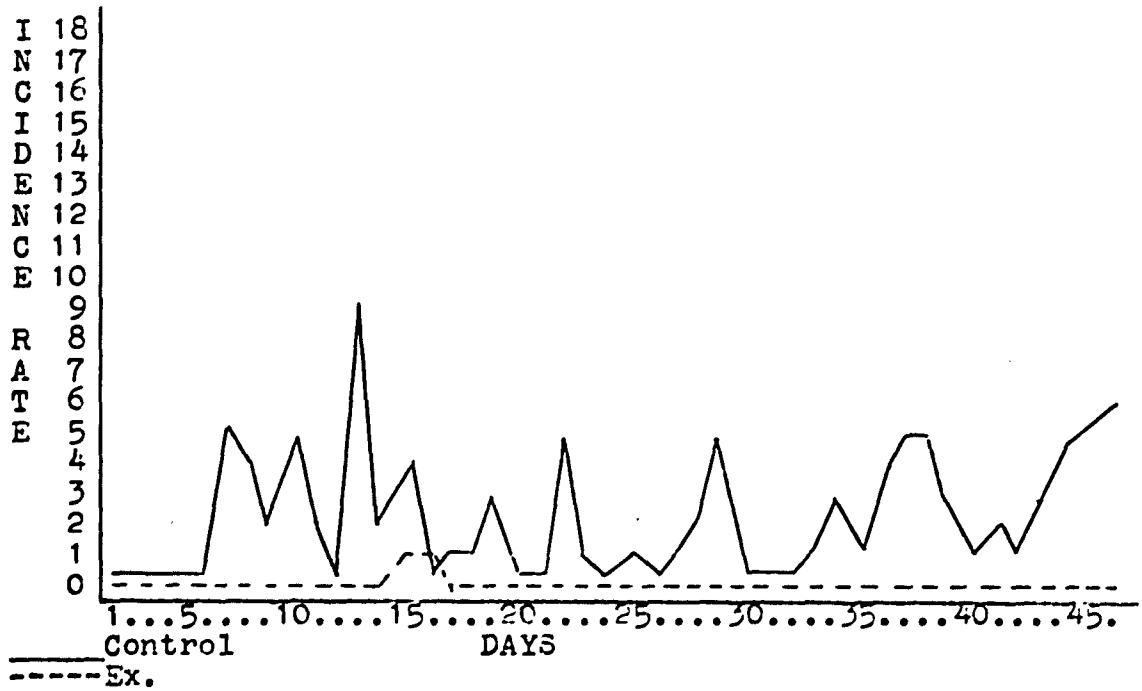

Table 38

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	0	0	0	0	0.00
B	2	1	0	1	.25
C	13	9.5	6	9.5	1.90
D	33	38.5	44	38.5	1.58

* P < .01
** P < .05

Table 39

EXPERIMENTAL AND CONTROL GROUP RATES FOR FIGHTING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	2	24	38.52*	0	25	48.0*
Control	46	24		50	25	

* P < .01
** P < .05

Swearing. The fourteenth hypothesis predicted there would be significantly more swearing behavior reported for the control group than for the experimental group. Table 40 below reflects the results of the evaluation of accumulated data for the groups over the entire experiment. These data are also graphically presented in figure 14 below. Further evaluation of the performance of separate cottages for the first half of the experiment was made with results as reflected in Table 41 below. Also compared was the performance of the experimental and control group over the first half of the experiment. These results are reported in Table 42 below.

TABLE 40

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	97	107.5	2.06
Control	118	107.5	

* P < .01
** P < .05

Figure 14

DAILY INCIDENCE RATE FOR SWEARING BEHAVIOR

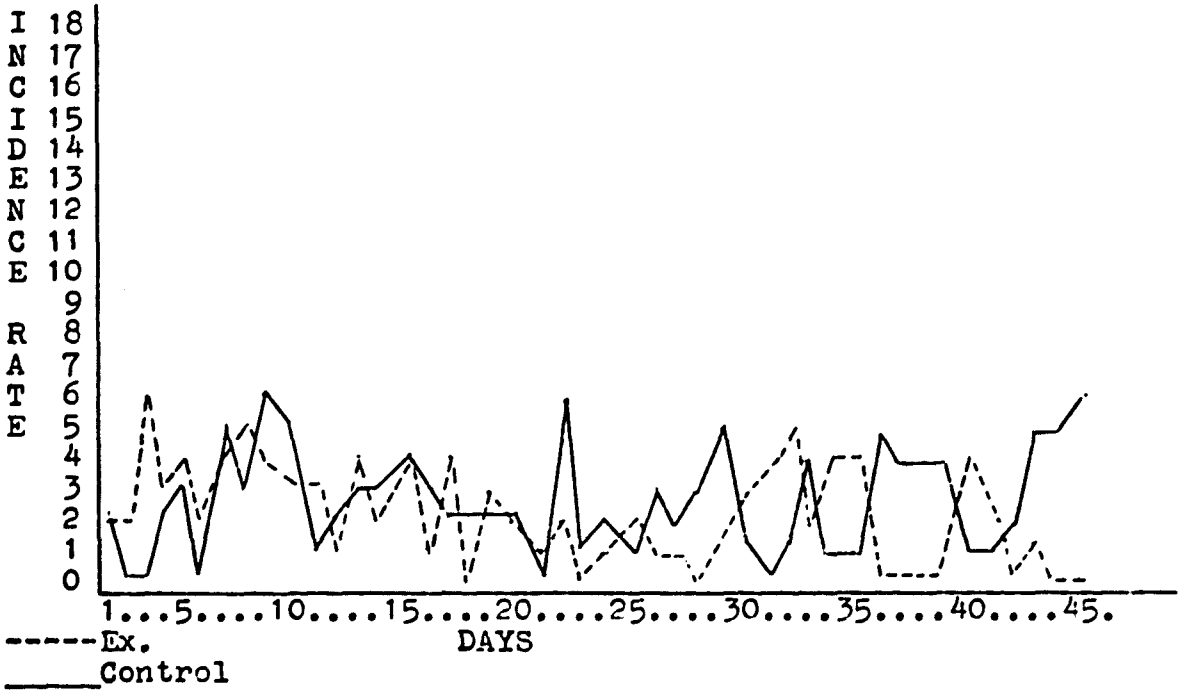

Table 41

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	52	41	30	41	5.60
B	10	7.5	5	7.5	1.06
C	21	17	13	17	1.54
D	32	37	42	37	1.36

* P < .01
** P < .05

Table 42

EXPERIMENTAL AND CONTROL GROUP RATES FOR SWEARING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	62	57.5	.704	35	45	4.44**
Control	53	57.5		55	45	

* P < .01
** P < .05

Bullying. The fifteenth hypothesis predicted there would be a significant difference between groups in reports of bullying behavior. Groups were compared and chi square computed with results as indicated in Table 43. Figure 15 also graphically represents these data. Separate cottage performance for the first half of the experiment was evaluated and results are reported in Table 44. The experimental and control groups were further compared for the first half of the experiment with results as reflected in Table 45 below.

TABLE 43

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	25	32	3.06
Control	39	32	

* P < .01
** P < .05

Figure 15

DAILY INCIDENCE RATE FOR BULLYING BEHAVIOR

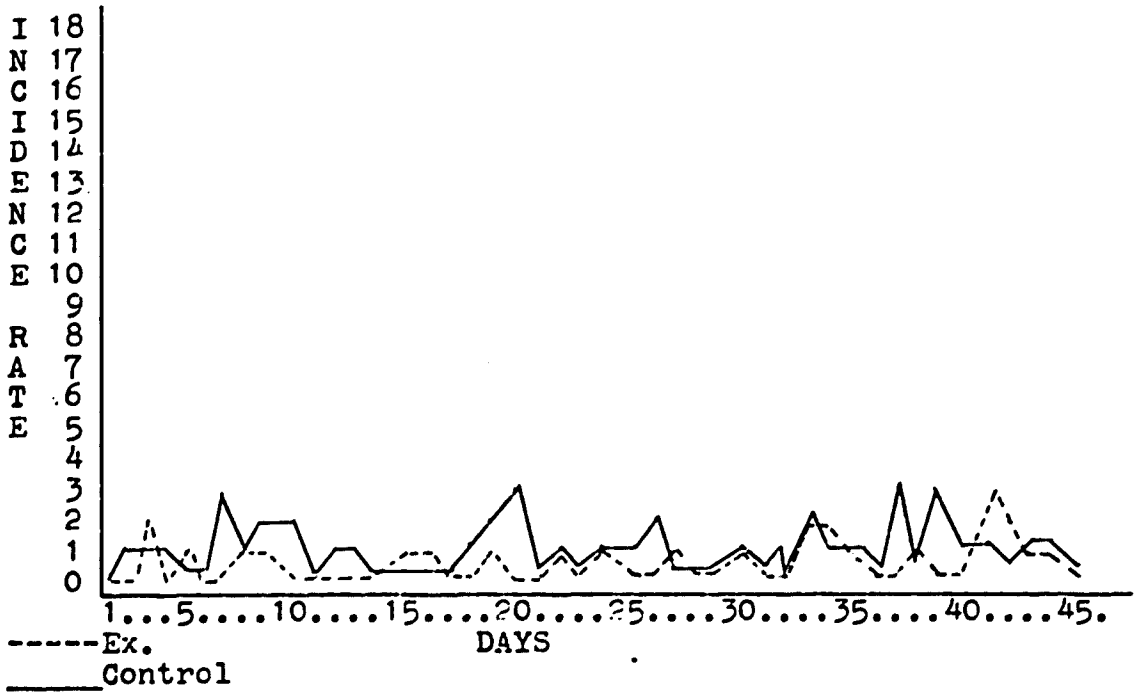

Table 44

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	2	5.5	9	5.5	4.44**
B	7	7	7	7	0.00
C	17	15.5	14	15.5	.13
D	3	4	5	4	.126

* P < .01
** P < .05

Table 45

EXPERIMENTAL AND CONTROL GROUP RATES FOR BULLYING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	9	14.5	2.06	16	17.5	.114
Control	20	14.5		19	17.5	

* P < .01
** P < .05

Loud Talk. The sixteenth hypothesis predicted a significant difference between groups in loud talk behavior would be reported in favor of the experimental group. Analysis of accumulated data and computation of chi square is reflected in Table 46 below. Figure 16 also reflects these data graphically. Further evaluation was made of the performance of each cottage for the first half of the experiment. These results are reported in Table 47 below. An evaluation of the performance of the experimental group as compared to the control group was also made with results as reflected in Table 48 below.

TABLE 46

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	236	279	13.25*
Control	322	279	

* P < .01
** P < .05

Figure 16

DAILY INCIDENCE RATE FOR LOUD TALK BEHAVIOR

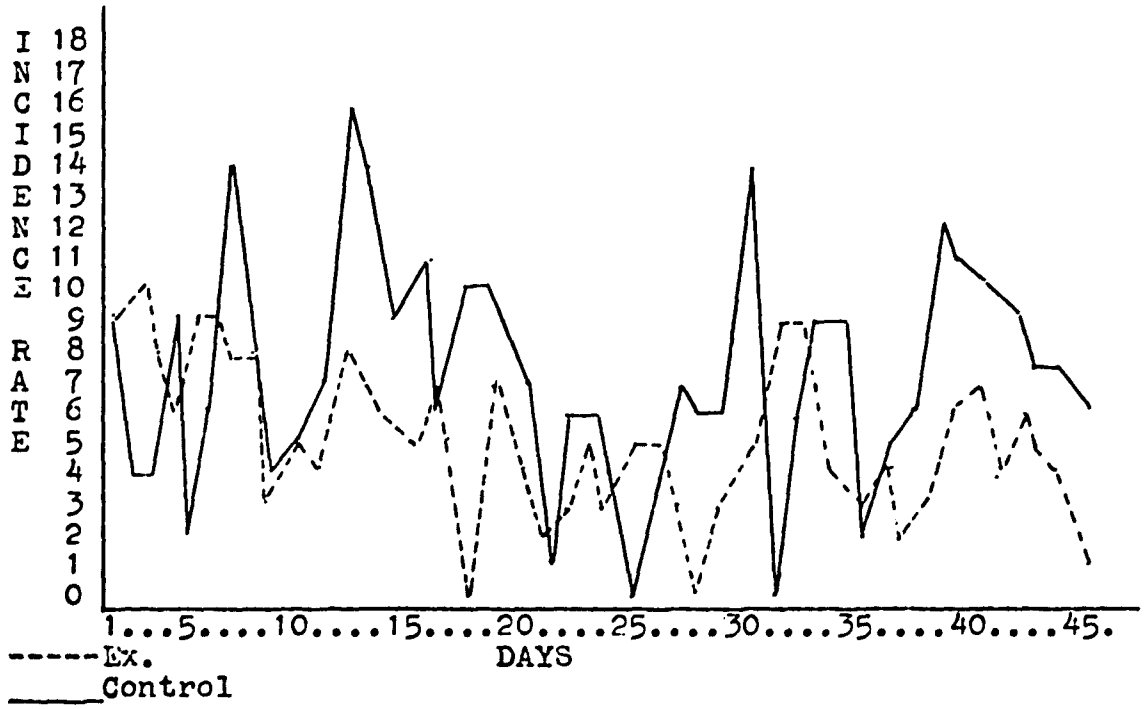

Table 47

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	94	78	62	78	6.56**
B	42	40	38	40	.20
C	88	66.5	45	66.5	13.90*
D	84	94.5	105	94.5	2.34

* P < .01
** P < .05

Table 48

EXPERIMENTAL AND CONTROL GROUP RATES FOR LOUD TALK BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	136	154	4.20**	100	125	10.0*
Control	172	154		150	125	

* P < .01
** P < .05

Impudent. The seventeenth hypothesis predicted there would be significantly more reports of behavior categorized as impudent reported for the control group than for the experimental group. Group comparison over the entire length of the experiment was made and chi square computed. These results are reported in Table 49 and are graphically represented in figure 17 below. Reported impudent behavior for the first half of the experiment was evaluated for each cottage. The results of this evaluation are reported in Table 50. Further comparison was made between groups for the first half of the experiment and the results are reported in Table 51 below.

TABLE 49

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	113	82	23.42*
Control	51	82	

* P < .01
** P < .05

Figure 17

DAILY INCIDENCE RATE FOR IMPUDENT BEHAVIOR

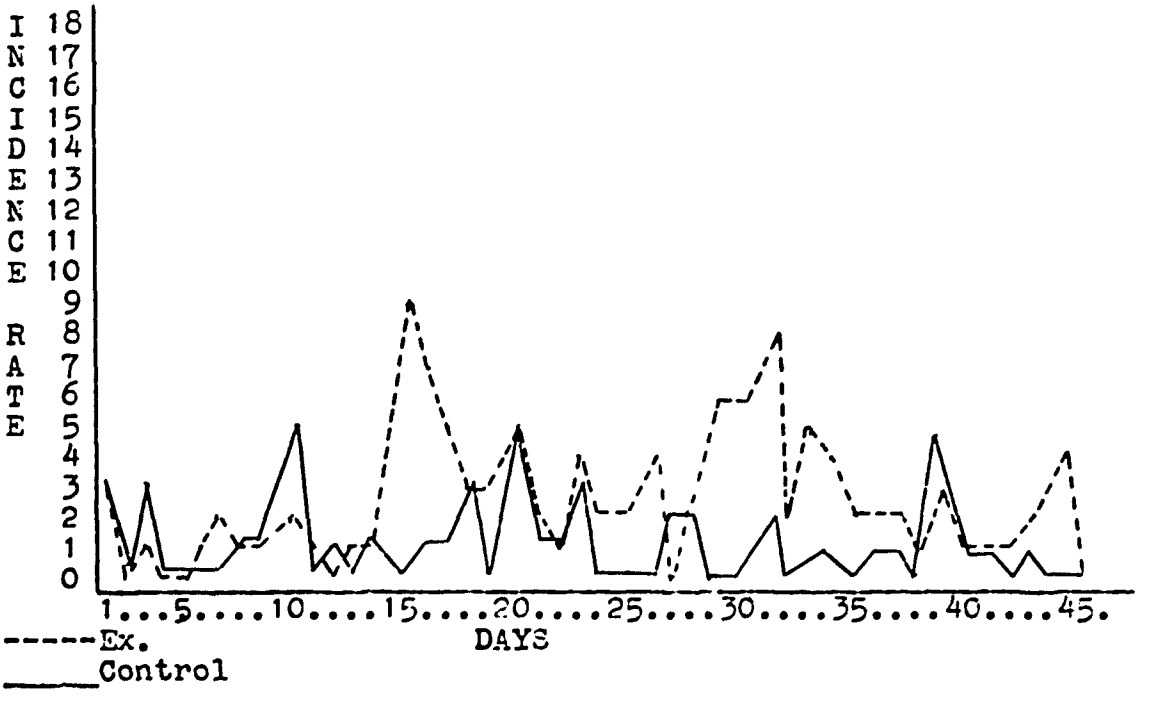

Table 50

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	36	45.5	55	45.5	3.96**
B	15	11	7	11	2.22
C	22	18.5	15	18.5	.98
D	5	7	9	7	.64

* P < .01
** P < .05

Table 51

EXPERIMENTAL AND CONTROL GROUP RATES FOR IMPUDENT BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	51	34.5	7.38*	62	43	16.78*
Control	27	34.5		24	43	

* P < .01
** P < .05

Irritable. The eighteenth hypothesis predicted there would be significantly more irritable behavior reported for the control group than for the experimental group. Evaluation of data comparing groups was accumulated over the entire length of the experiment. The results of this evaluation are reported in Table 52 and are further graphically presented in figure 18 below. Evaluation of separate cottage performance was also made of behavior over the first half of the experiment. These results are reflected in Table 53 below. Also evaluated was the difference between groups over the first half of the experiment. These results are reported in Table 54 below.

TABLE 52

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	84	163.5	77.30*
Control	243	163.5	

*P < .01
**P < .05

Figure 18

DAILY INCIDENCE RATE FOR IRRITABLE BEHAVIOR

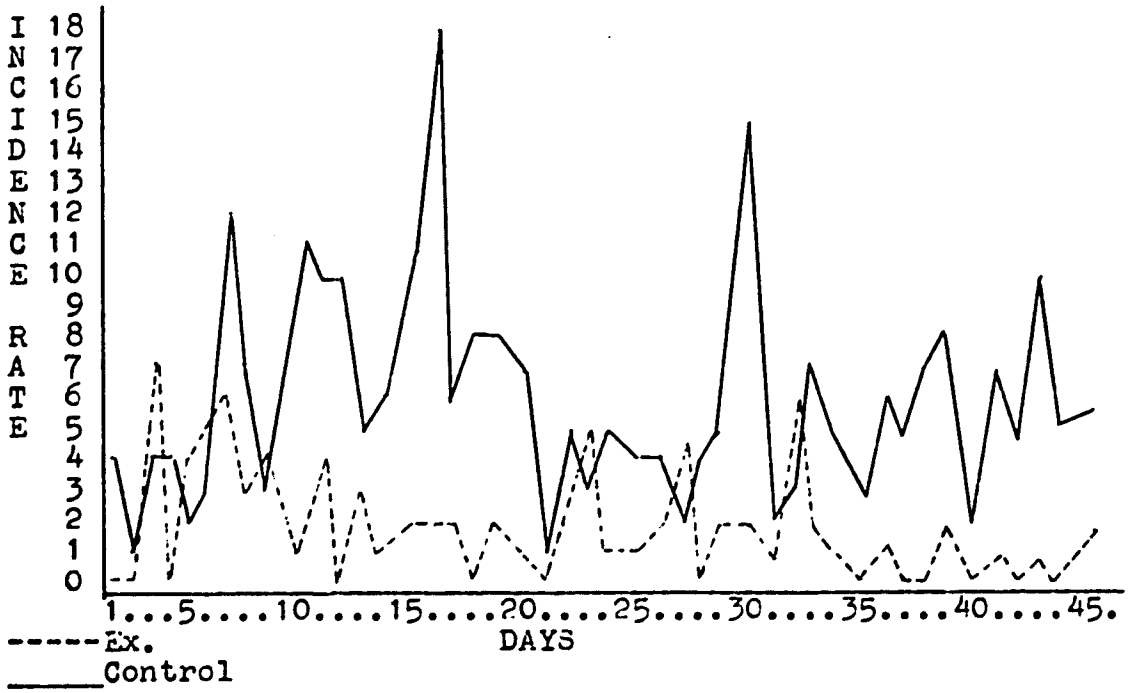

Table 53

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

Group	1 Obs	Exp	2 Obs	Exp	X^2
A	27	21.5	16	21.5	2.80
B	24	20.5	17	20.5	.08
C	82	61.5	41	61.5	13.66*
D	48	60	72	60	4.80**

* P < .01
** P < .05

Table 54

EXPERIMENTAL AND CONTROL GROUP RATES FOR IRRITABLE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

Group	1 Obs	Exp	X^2	2 Obs	Exp	X^2
Exper.	51	90.5	34.48*	33	73	43.98*
Control	130	90.5		113	73	

* P < .01
** P < .05

Untidy. The nineteenth hypothesis predicted there would be significantly more reports of untidiness for the control group than for the experimental group. Group comparison over the entire length of the experiment resulted in data as reflected in Table 55 below. These data are also graphically presented in figure 19. Each cottage was separately evaluated as to rate of incidents for the first half of the experiment. These results are reflected in Table 56. Experimental and control groups were also compared for the first half of the experiment and these results are found in Table 57.

TABLE 55

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	236	185.5	27.50*
Control	135	185.5	

* P $\leq$ .01
** P $\leq$ .05

Figure 19

DAILY INCIDENCE RATE FOR UNTIDY BEHAVIOR

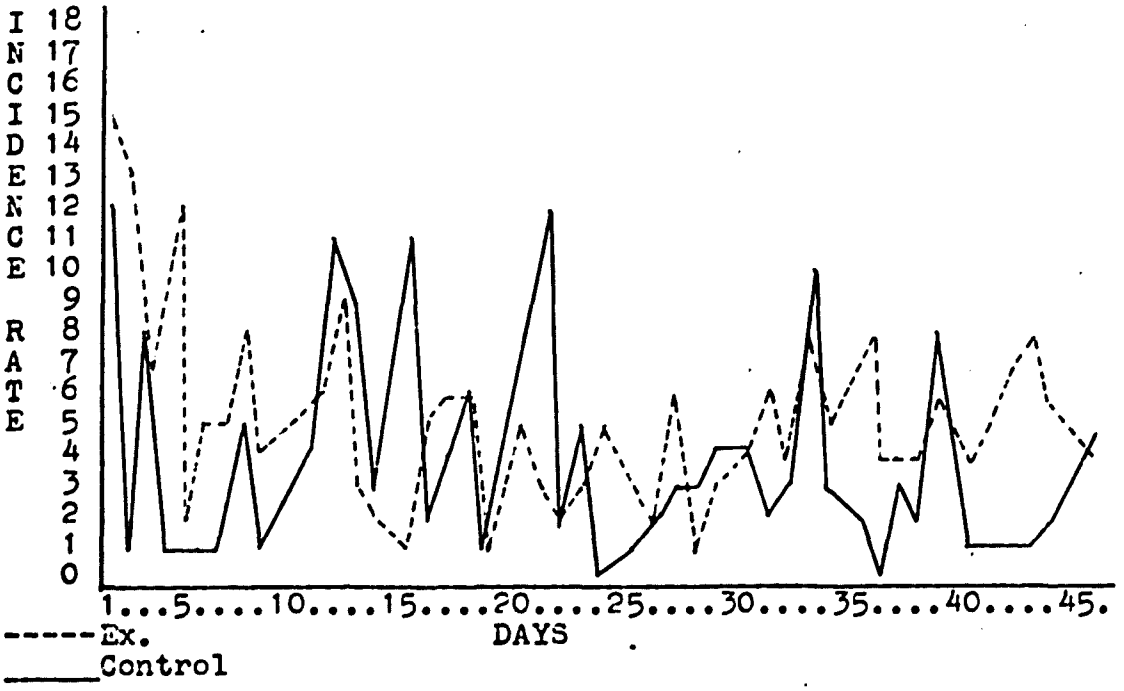

Table 56

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	34	40	46	40	1.80
B	93	78	63	78	5.78**
C	36	21.5	7	21.5	18.24*
D	51	46	41	46	1.08

* P < .01
** P < .05

Table 57

EXPERIMENTAL AND CONTROL GROUP RATES FOR UNTIDY BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	127	107	7.48*	109	78.5	23.70*
Control	87	107		48	78.5	

* P < .01
** P < .05

Stealing. The twenteth hypothesis predicted there would be significantly more acts of stealing reported for the control group than for the experimental group. Group comparison of data accumulated over the entire period of the experiment reflected results as indicated in Table 58 below. Figure 20 also graphically represents these data. Individual cottage rates of stealing behavior were evaluated for the first half of the experiment with results as reported in Table 59. The experimental was compared to the control group for a period covering the first half of the experiment. These results are reflected in Table 60 below.

TABLE 58

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	10	14.5	2.78
Control	19	14.5	

* P < .01
** P < .05

Figure 20

DAILY INCIDENCE RATE FOR STEALING BEHAVIOR

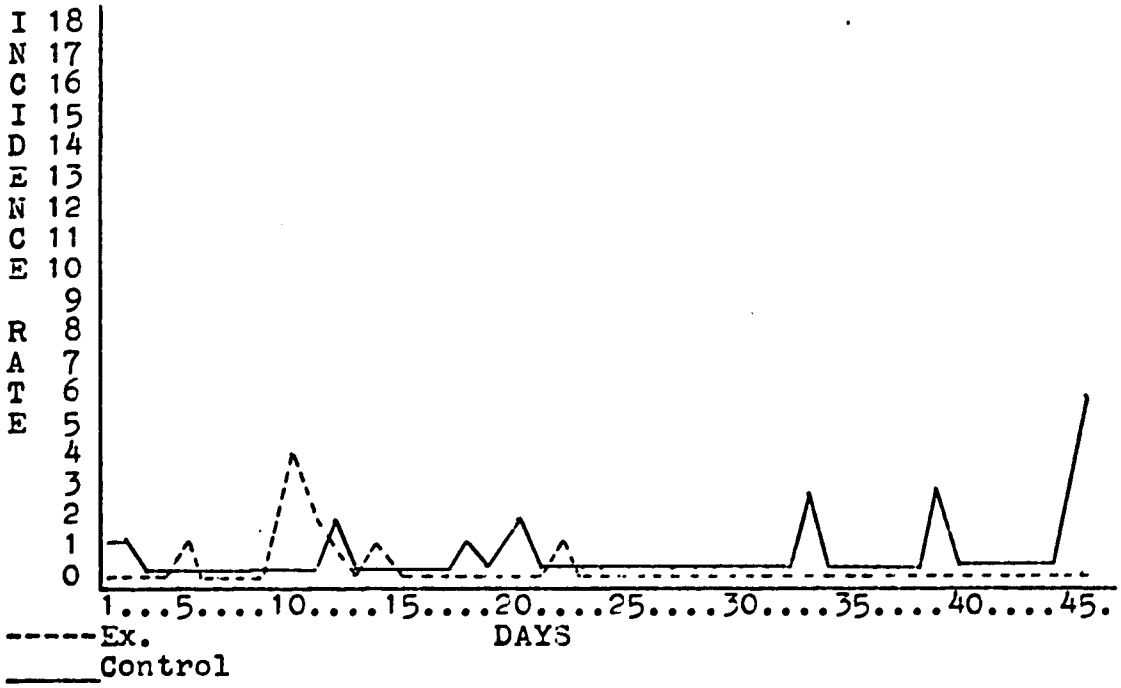

Table 59

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	1	.5	0	.5	1.00
B	9	4.5	0	4.5	7.12*
C	6	6	6	6	0.00
D	1	3.5	6	3.5	2.28

* P < .01
** P < .05

Table 60

EXPERIMENTAL AND CONTROL GROUP RATES FOR STEALING BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	10	8.5	.236	0	6	0.08*
Control	7	8.5		12	6	

* P < .01
** P < .05

Uncooperative. The twenty-first hypothesis predicted there would be significantly more uncooperative acts of behavior reported for the control group than for the experimental group. Data was accumulated and evaluated for the experimental and control groups. The results of this evaluation are reported in Table 61 and are graphically represented in figure 21 below. Further evaluation was made of behavior reported for the first half of the experiment. This evaluation was made for separate cottages and the results are shown in Table 52. Also evaluated for the first half of the experiment was the performance of the experimental and control groups. These results are reflected in Table 63 below.

TABLE 61

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	51	178	181.22*
Control	305	178	

* P < .01
** P < .05

Figure 21

DAILY INCIDENCE RATE FOR UNCOOPERATIVE BEHAVIOR

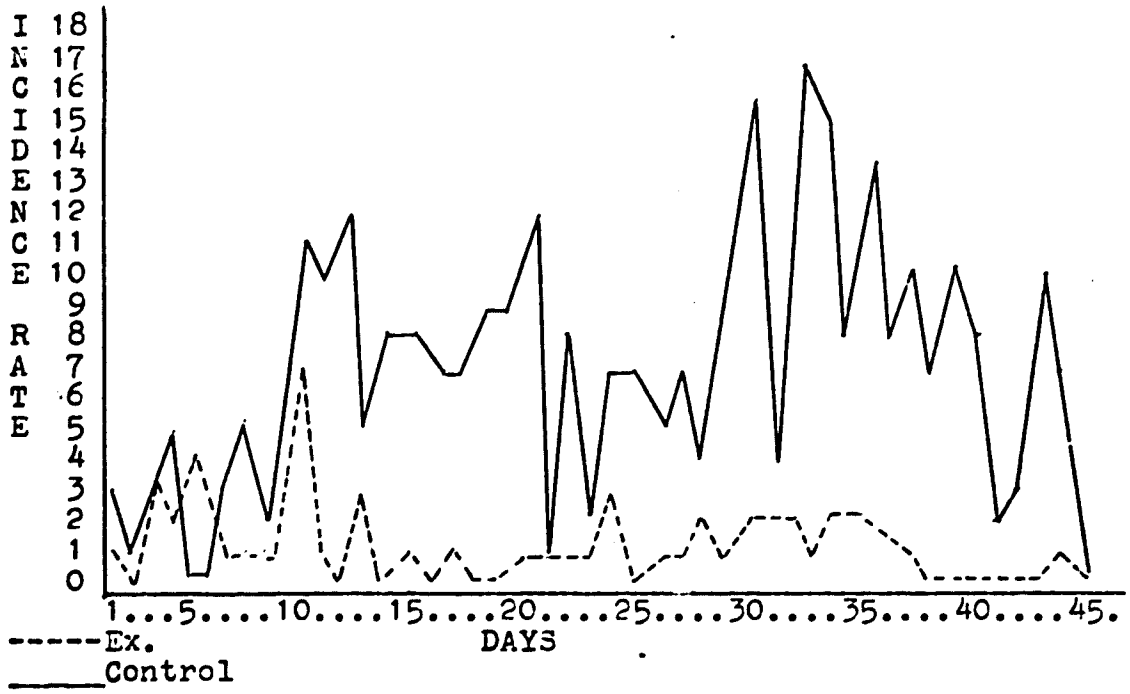

Table 62

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	17	13	9	13	2.44
B	12	12.5	13	12.5	0.00
C	64	62.5	61	62.5	.072
D	66	90	114	90	12.8*

* P < .01
** P < .05

Table 63

EXPERIMENTAL AND CONTROL GROUP RATES FOR UNCOOPERATIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	29	79.5	64.16*	22	98.5	119.84*
Control	130	79.5		175	98.5	

* P < .01
** P < .05

Temper Tantrum. The twenty-second hypothesis predicted there would be significantly more temper tantrum behavior reported for the control group than for the experimental group. Comparison of groups over the entire length of the experiment resulted in data as reflected in Table 64 below. These data are also graphically presented in figure 22. Separate cottage performance was evaluated for the first half of the experiment and these results are reported in Table 65. Also evaluated for the first half of the experiment was the performance of the experimental and control groups. Table 66 reflects these results.

TABLE 64

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	6	63	103.2*
Control	120	63	

* P $\leq$ .01
** P $\leq$ .05

Figure 22

DAILY INCIDENCE RATE FOR TANTRUM BEHAVIOR

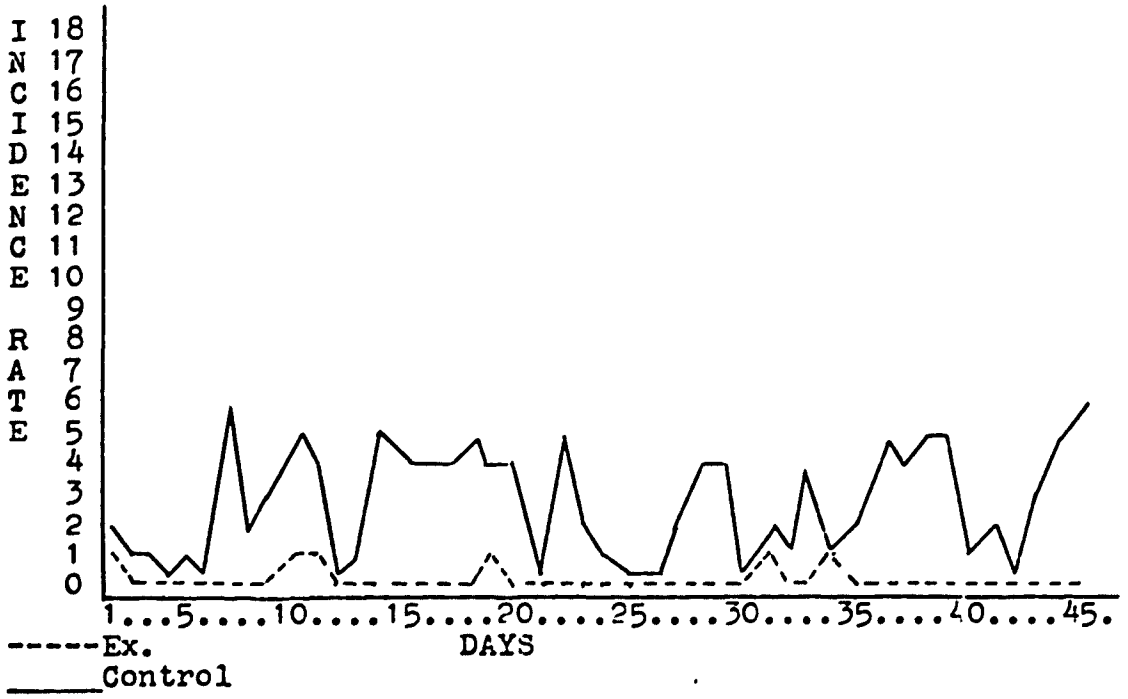

Table 65

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	1	1.5	2	1.5	.32
B	3	1.5	0	1.5	1.34
C	28	22	16	22	2.76
D	33	38	43	38	1.32

* P < .01
** P < .05

Table 66

EXPERIMENTAL AND CONTROL GROUP RATES FOR TANTRUM BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	4	32.5	48.24*	2	30.5	51.4*
Control	61	32.5		59	30.5	

* P < .01
** P < .05

Callous. The twenty-third hypothesis predicted there would be significantly more acts of callous behavior reported for the control group than for the experimental group. Comparison of group performance resulted in data as reflected in Table 67. These data are also graphically presented in figure 23 below. Each cottage performance was separately evaluated for the first half of the experiment. These results are reported in Table 68. The performance of the experimental and control groups was also evaluated for the first half of the experiment with results as reported in Table 69 below.

TABLE 67

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	42	47.5	1.26
Control	53	47.5	

* P < .01
** P < .05

Figure 23

DAILY INCIDENCE RATE FOR CALLOUS BEHAVIOR

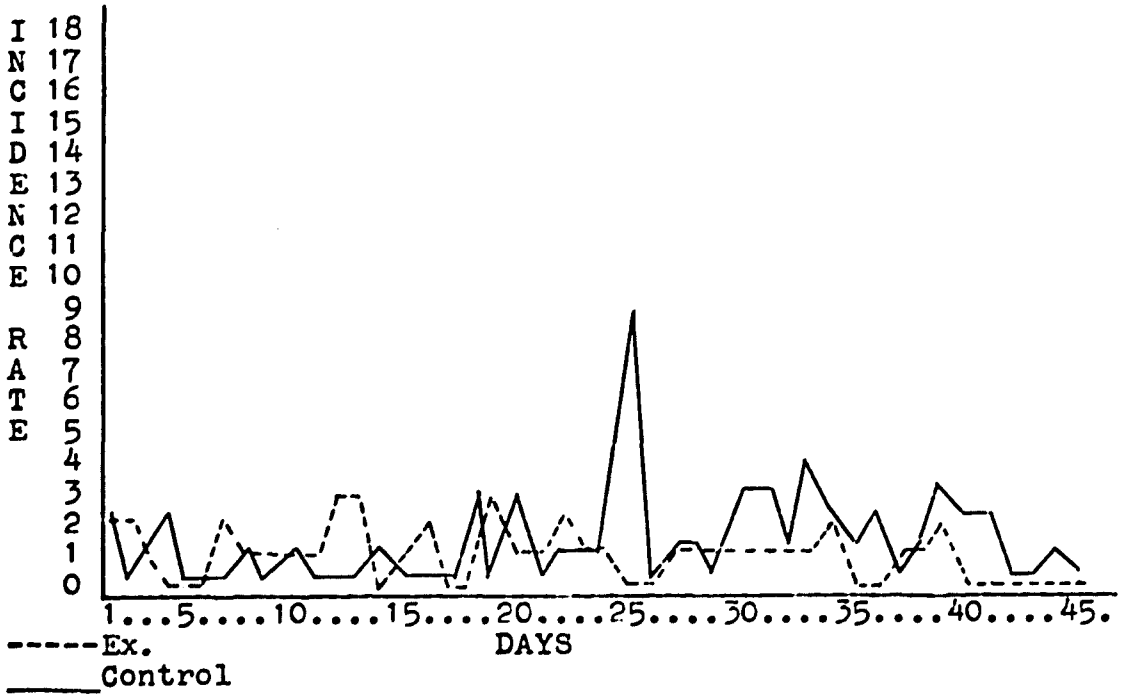

Table 68

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1			2	
Group	Obs	Exp	Obs	Exp	X^2
A	0	.5	1	.5	1.00
B	28	20.5	13	20.5	4.78**
C	11	17	23	17	3.56
D	3	9.5	16	9.5	7.50*

* P < .01
** P < .05

Table 69

EXPERIMENTAL AND CONTROL GROUP RATES FOR CALLOUS BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	28	21	4.02**	14	26.5	10.86*
Control	14	21		39	26.5	

* P < .01
** P < .05

Sullen. The Twenty-fourth hypothesis predicted significantly more sullen behavior would be reported for the control group than for the experimental group. Accumulation of data and computation of chi-square for group performance was accomplished. These results are reported in Table 70 and are also graphically presented in figure 24 below. Separate cottage performance was also evaluated for the first half of the experiment. These results are shown in Table 71. Comparison between experimental and control group performance was also accomplished for the first half of the experiment. These results are reported in Table 72 below.

TABLE 70

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	82	81.5	.006
Control	81	81.5	

* P < .01
** P < .05

Figure 24

DAILY INCIDENCE RATE FOR SULLEN BEHAVIOR

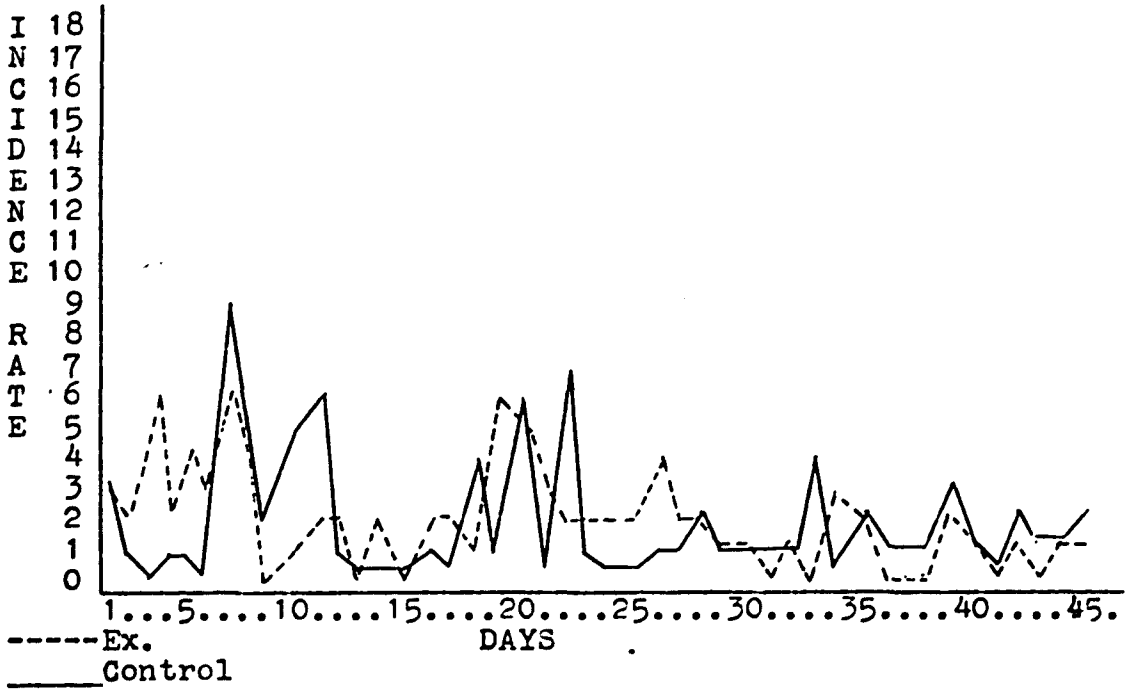

Table 71

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	10	6	2	6	5.32**
B	48	35	22	35	9.72*
C	46	34	22	34	8.46*
D	7	6.5	6	6.5	0.00

* P < .01
** P < .05

Table 72

EXPERIMENTAL AND CONTROL GROUP RATES FOR SULLEN BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	58	111	.226	24	26	.30
Control	53	111		28	26	

* P < .01
** P < .05

Charges. The twenty-fifth hypothesis predicted there would be a significant difference between groups in accomplishing assigned tasks. The variable "charges" was evaluated for the experimental and control group over the entire length of the experiment. Table 73 below reflects the results of this evaluation. Figure 25 also graphically illustrates these results. Separate cottage performance was also evaluated for the first half of the experiment and these results are reflected in Table 74. Experimental group performance was further compared to control group performance for the first half of the experiment. Table 75 reflects these results.

TABLE 73

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	138	280.5	285.12*
Control	423	280.5	

* P < .01
** P < .05

Figure 25

DAILY INCIDENCE RATE FOR CHARGES BEHAVIOR

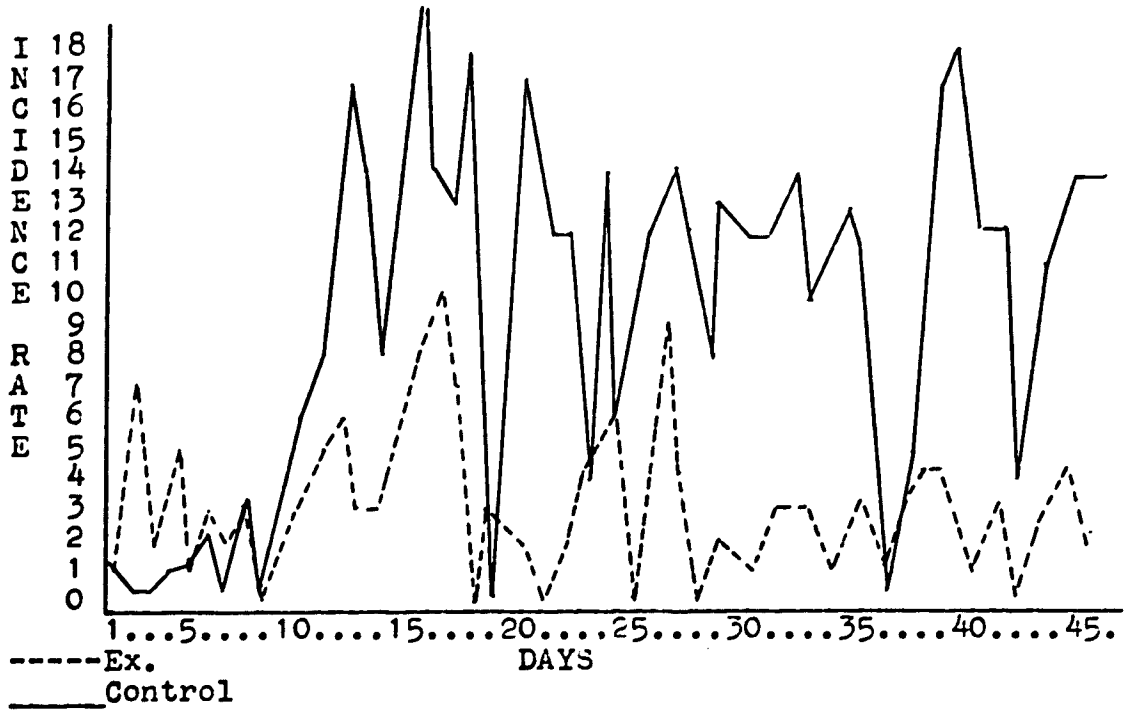

Table 74

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	29	35.5	42	35.5	2.32
B	48	33.5	19	33.5	11.70*
C	31	24.5	18	24.5	2.12
D	137	187	237	187	26.74*

* P < .01
** P < .05

Table 75

EXPERIMENTAL AND CONTROL GROUP RATES FOR CHARGES BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	77	122.5	33.8*	61	158	119.10*
Control	168	122.5		255	158	

* P < .01
** P < .05

Positive Comments. The twenty-sixth hypothesis predicted there would be significantly more positive comments reported for the experimental group than for the control group. Comparison between groups was accomplished by evaluating accumulated data and computing chi square. The results of this evaluation, covering the entire length of the experiment, are reflected in Table 76. These data are also graphically presented in figure 26 below. Evaluation of separate cottage performance for the first half of the experiment was further accomplished with results as indicated in Table 77. Differences between groups was also evaluated for the first half of the experiment. These results are reported in Table 78 below.

TABLE 76

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	313	182	188.58*
Control	51	182	

* P / .01
** P Z .05

Figure 26

DAILY INCIDENCE RATE FOR POSITIVE BEHAVIOR

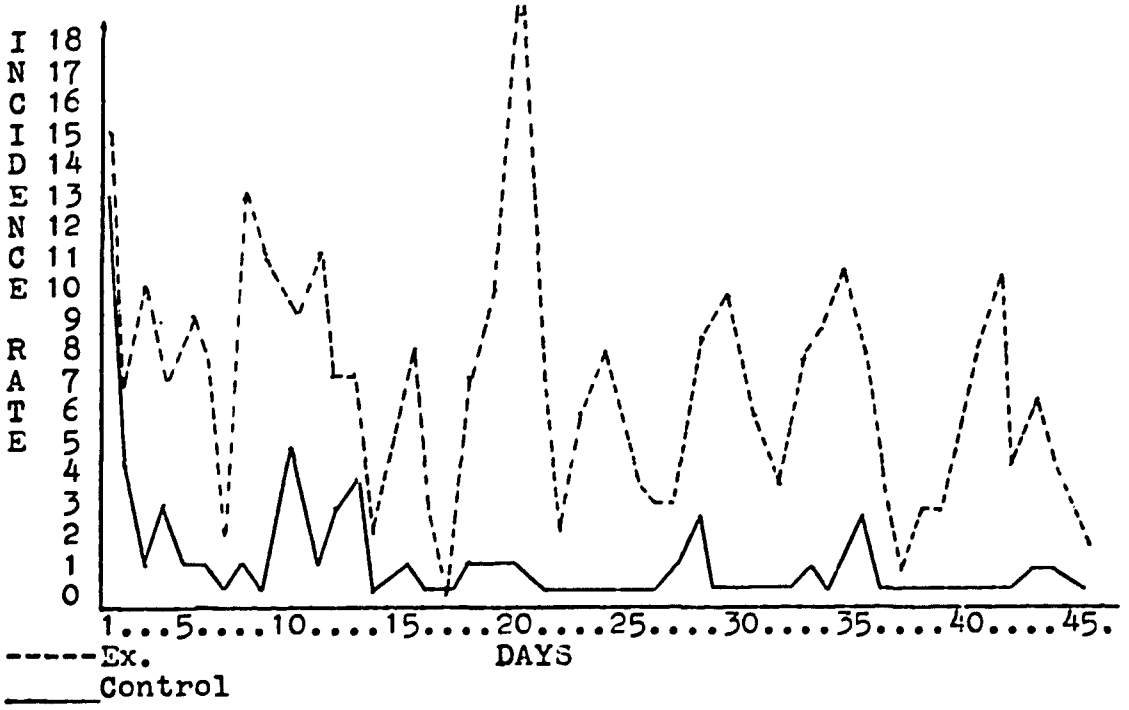

Table 77

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	82	66.5	51	66.5	7.22*
B	94	90	86	90	.36
C	20	14.5	9	14.5	3.44
D	21	11	1	11	18.18*

* P < .01
** P < .05

Table 78

EXPERIMENTAL AND CONTROL GROUP RATES FOR POSITIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	176	108.5	33.30*	137	73.5	108.0*
Control	41	108.5		10	73.5	

* P < .01
** P < .05

Negative Behaviors. The twenty-seventh hypothesis predicted there would be significantly more negative behavior reported voluntarily for the control group than for the experimental group. Group comparison resulted in data as reflected in Table 79. These data, accumulated over the entire length of the experiment, are also graphically presented in figure 27 below. Separate cottage performance was also evaluated and results are reported in Table 80. These results reflect data accumulated over the first half of the experiment. Group comparison for the first half of the experiment was also accomplished. These results are reflected in Table 81 below.

TABLE 79

GROUP COMPARISON - ENTIRE EXPERIMENT

Group	Observed	Expected	Chi Sq.
Exper.	41	70	24.02*
Control	99	70	

* P < .01
** P < .05

Figure 27

DAILY INCIDENCE RATE FOR NEGATIVE BEHAVIOR

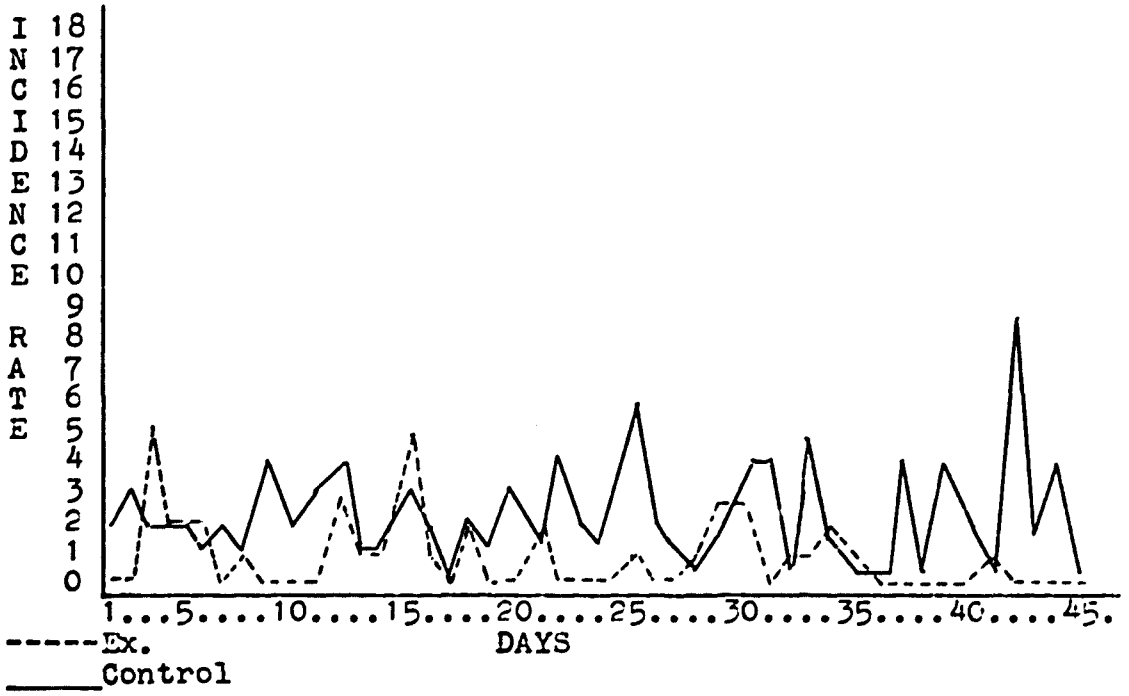

Table 80

SEPARATE COTTAGE RATES FOR FIRST AND SECOND HALVES OF EXPERIMENT

	1		2		
Group	Obs	Exp	Obs	Exp	X^2
A	13	13.5	14	13.5	1.00
B	14	7	0	7	12.06*
C	30	26	22	26	1.24
D	17	23.5	30	23.5	2.22

* P < .01
** P < .05

Table 81

EXPERIMENTAL AND CONTROL GROUP RATES FOR NEGATIVE BEHAVIOR FOR FIRST AND SECOND HALVES OF THE EXPERIMENT

	1			2		
Group	Obs	Exp	X^2	Obs	Exp	X^2
Exper.	27	37	5.40**	14	33	20.74*
Control	47	37		52	33	

* P < .01
** P < .05

Subjective vs. Behavioral Variables. It was possible for an independent judge and the experimenter to agree upon those variables more vague in nature as compared to variables which were behavioral in nature. Group comparison was made of the performance rates of eight variables so defined. Data were accumulated and chi square computed for the variables Bullying, Impudent, Callous and Sullen as compared to the variables Tardy, Fighting, Stealing and Charges. Results of this comparison are reported in Table 82 below.

TABLE 82

	BEHAVIORAL			VAGUE		
Group	Obs.	Exp.	Chi Sq.	Obs.	Exp.	Chi Sq.
Exper.	190	403.5	220.98*	295	314	2.30
Control	617	403.5		333	314	

* P < .01
** P < .05

CHAPTER V

DISCUSSION

The discussion of results will be two pronged: the first will relate to evaluation and consideration of traditional statistical techniques; the second will reflect more impressionistic factor.

A. STATISTICAL ANALYSIS

School.

Tardy. The negative histories of most delinquents in relation to school attendance were probably important factors in the general attitude of student unconcern for punctuality in getting to class. As a result, school personnel requested the variable "Tardy" be included in the experiment. The term Tardy was defined as arriving at the assigned classroom after the tardy bell had sounded and does not refer to punctuality in arriving at the school building.

Teachers were not instructed in specific methods of dealing with tardy cases nor were they specifically advised how to reward promptness. As a result, no clear pattern was established between teachers. Some rewarded immediately those who were prompt while others paid a "bonus" at the end of the class. Some teachers held back all tokens for those who were tardy while others rewarded on a more discriminative basis. Individual teacher performance also

varied over the course of the experiment. The absence of definitive and uniform procedures, while creating some difficulty in determing treatment effect, nevertheless tended to preserve the real-to-life aspect of the experiment wherein teachers traditionally manage their classes as they see fit. The concept of rewarding socially acceptable behavior was, however, held constant by all teachers.

The data seem to support the hypothesis that rewarded groups tend to have fewer reported incidents of tardy behavior for the experiment. Analysis of individual cottage performance over the first half of the experiment, however, is less clear. Both experimental cottages showed an increase in tardy behavior during the second half of the experiment whil one control cottage showed such a trend and one did not. Comparison of groups for the first half of the experiment, however, again indicates a significant difference and reflects a trend in favor of the experimental group. Perhaps the vagueness of procedures in handling tardy behaviors and individual teacher variations provided for a somewhat less than clear picture of treatment effect.

Swearing. The variable "Swearing" was included as a behavioral trait since it is found in the verbal repertoire of most delinquents (Hewitt and Jenkins, 1946). Further, the use of obscenities was abhorrant to most of

the religious of the institution and staff personnel requested the variable be included in the design of the experiment. Here, as in other instances, it was deemed advisable to adhere to the practices and values of the institution rather than imposing those of the experimenter thus preserving the real-life dimension of the experiment.

Even though more reports of swearing behavior were indicated for the control group than for the experimental group, the difference is not significant. The total number of reports for both groups seems low. There may have been a reluctance on the part of lay persons to "report" behavior not seen by them as especially deviant. One may assume, at least, that swearing behavior would be more anxiety-producing to religious personnel than to lay persons.

No clear trend was established by each of the experimental cottages between performances for the first half of the experiment and the second half. Both cottages performed exactly the same for both halves. One control cottage had fewer reports for the second half than for the first but the decrease was insignificant and would not clearly indicate a trend. The other control cottage increased its reports for the second period. A slight trend in favor of the experimental group is noted in group comparisons for performances during the first and second half of the experiment.

Thus, while a difference exists between groups for the entire experiment in favor of the experimental group, it is not significant. Further, it is not possible to demonstrate a definite trend over time for groups or for cottages.

Bullying. Attempting to rate behavior presupposes the ability to recognize the behavior to be rated. Certain variables, however, were rather vague in definition. "Bullying" behavior falls in this category. The problems created by the lack of clear definition of the behavior to be rated was compounded by the use of many raters. One may assume that behavior recognized as bullying by one rater could conceivably be reported under the variable "irritability" or "callous" by another, as an example.

The extremely low rate of bullying behavior reported for all groups probably can be attributed to the vagueness in terms of what was meant by the term. Even though a higher rate was reported for the control group than for the experimental group, the difference was not significant. Individual cottage performance, though showing variations between the first half and the second half of the experiment, reflects such a low rate of incidence that it is not possible to show significant trends. Comparisons for the first half of the experiment were in favor of the experimental group, but again the difference was insignif-

icant and connot be interpreted to indicate treatment effect.

The general vagueness of the variable probably can be seen as the factor most directly responsible for the insignificant results.

Loud Talk. Personnel were requested to suggest, for inclusion in the design of the experiment behavior which the institution defined as socially unacceptable and disconcerting to the staff. The variable "loud talk" was thus recommended and included. While one may disagree with the classification of loud talk as socially unacceptable it must be recognized that such is within the values of the society created by the institution that the subjects must adjust to. It should also be recognized that it is often a lack of ability to behave in accord with particular norms of behavior that has led to need for placement in an institution. It was hoped that the demonstration of the ability to modify behavior in conformity with institutional values would benifit subjects as they eventually re-entered the larger society.

What constitutes loud talk is, of course, a matter of individual judgement and no clear definition can be made. Most teachers, however, interpreted loud talk to mean verbal outburst sufficient in intensity to be disturbing to others in the classroom. Here again, individual differences

existed between raters as tolerance levels varied. Probably individual rating performance also varied over the course of the experiment.

Comparison of groups for the entire experiment reflects a very significant difference between groups. This difference is in favor of the experimental group and is significant enough to demonstrate treatment effect. (Approximately twice as many reports for the control group as for the experimental group). Individual cottage performance, however, gives a less clear picture. One experimental cottage reports a significant increase for the second half of the experiment as compared to the first half. The other experimental cottage shows a decline in second half reports, but the decline was insignificant. The control group cottages show a similar pattern with one increasing and one decreasing loud talk behavior for the second half of the experiment. Thus no clear trend is demonstrated for individual cottages, experimental or control. Group comparison, however, again reflects a significant difference in favor of the experimental groups for the first half of the experiment.

The total incidence reports are significantly greater for the control group than for the experimental group as comparison at the end of the first half of the experiment and for the total experiment. It is not possible, however

to indicate trend-over-time for individual cottages. The difficulty in demonstrating trend-over-time treatment effects may be due to the process of administering rewards employed by the raters. A student in the experimental group engaging in loud talk would not automatically forfeit tokens or suffer other extraordinary punishment. Also, there were no clear guidelines for teachers who, as stated above, managed their classes as they saw fit. Thus no direct effort at extinction of loud talk behavior over a specific period of time could be demonstrated. It is interesting that the total numbers of loud talk behaviors reported for both groups is greatly in favor of the experimental group significantly indicating the effect of the treatment. Perhaps the concept of being rewarded for all socially positive behaviors, including verbal class behavior, generally had a positive effect on most members of the experimental group even though a trend-over-time cannot be demonstrated due to the absence of uniform procedures designed to extinquish specific behaviors.

Impudent. Another variable in those included in the design of the experiment at the request of institution personnel was "Impudence". This variable, plus others recommended by the staff, is included in a cluster of behaviors seen by the institution as especially socially unacceptable. Together, they are reflective of its values.

Impudence was defined as behaving in an insulting manner, talking back, being "cocky" or otherwise demonstrating disrespect toward an adult. The variable does not refer to behavior between peers.

Comparison of groups for the entire experiment indicates a significant difference between groups in favor of the experimental group. This difference (over three times as many cases of impudence reported for the control group than for the experimental group) is significant enough to indicate treatment effect and to make unlikely the effects of novelty. Again, attempting to demonstrate trends as the experiment progressed is difficult. Both experimental groups, as an example, actually increased reports, one in a statistically significant manner. But closer analysis of this cottage indicates that this increase (from zero reports the first half to six reports for the second) represents such a small total incidence rate considering the total number of students and the length of time involved that it would be difficult to state positively that a trend is indicated in one direction or another. It would not seem appropriate to state that a significant trend exists on the basis of six reports which could conceivably be attributed to the behavior of one girl who was experiencing an especially trying day. One control cottage showed no change between the first half incidence

rate and the second half incidence rate while the other control cottage increased significantly as the experiment progressed. Attempting to demonstrate trends by comparing first half individual cottage performances against second half performances continued to provide difficulties.

Comparison of experimental and control groups for the first half of the experiment indicates a significant difference between groups with the control group having over eight times as many reports as the experimental group. This trend of differences continued for the entire experiment.

Thus, while not indicating significant individual cottage trends, significantly fewer reports were found for the experimental group than for the control group, so that treatment effect is indicated and the hypothesis is supported.

Irritable. The variable "Irritable" was included in the design of the experiment as behavior found in the repertoire of most delinquents (Hewett and Jenkins, 1946). Also, the often occuring irritable behavior of the subjects was seen as socially negative behavior by institution personnel. While no clear definition of the variable was afforded raters, it was generally assumed that such behaviors as arguing, fussiness and general disagreeableness were included under this variable. Raters again were free

to define the variable in their own way, thus precluding constancy between raters. One may also assume that tolerances of individual raters towards whatever they defined as irritable behavior would vary over the course of the experiment affecting the rate of reports. A certain amount of overlapping of variables probably occurred as behavior reported under the variable "Irritable" by one rater may have been reported under the variable, Uncooperative, Temper Tantrum, Bullying or Impudent by another. The same kind of confusion could have conceivably existed in individual raters over the course of the experiment. However, the advantages of testing the efficacy of a motivational system based on a system of rewards in a real-to-life situation far outweigh, it was believed, the advantages of percision usually associated with a more tightly controlled laboratory study.

A comparison of groups for the entire experiment indicates that significantly more reports of irritable behavior were recorded for the control group than for the experimental group. The difference seems large enough to make novelty effect influences unlikely and would seem to indicate actual treatment effect. The performances of individual cottages for the first half of the experiment as compared to the second half reflects no discernable trend. One experimental cottage had fewer reports for the

second half and one did not. The actual differences are, however, so slight as to be statistically insignificant. Similiarly, one control cottage decreased and one remained the same for the two periods. The decrease was not statistically significant. The comparisons for the first half of the experiment, however, again reflects a significant difference in favor of the experimental group. Thus, while not being able to report trends in individual cottages, significantly more reports were indicated for the control group than for the experimental group at the half way point and at the conclusion of the experiment supporting the hypothesis that a system of rewards has applicability in establishing a positive motivational environment.

Uncooperative. This variable was included in the design of the experiment upon the recommendation of the staff. The inability to conform to the values of society often is the main contributing factor leading to the placement of a young lady in an institution for delinquent girls. This inability to conform remains a part of the girls' behavioral repertoire as she arrives and is a source of concern to school personnel. The variable "uncooperative" was interpreted, in the school setting, to mean behaving in such a manner as to either ignore or obstruct the objectives of the teacher. Also included was the relationship and quality of behavior which existed between subjects. It

should again be recognized that individual raters were free to interpret the variable in their own way.

Analysis of data for the entire experiment reflects a very significant difference between groups in favor of the experimental group. This amount of difference seems sufficient to suggest a meaningful treatment effect. It is also possible to demonstrate trends by analysis of individual cottage performance. Both experimental cottages increased in reports for the second half of the experiment. The total report rate was low enough to make true differences questionable. Both control group cottages, however, exhibit a much greater total report rate. These groups also show a significant difference between the first half and the second half of the experiment with the increase being in the second half. Group comparison for the first half of the experiment reflects a very significant difference in favor of the experimental group with over six times as many negative reports indicated for the control group than for the experimental group.

Overall, analysis of all the data indicated significant differences in favor of the experimental group for comparisons at the half way point and the conclusion of the experiment indicating support for the hypothesis. Individual cottage trends indicated significant increases for the control groups between halves of the experiment while a

less clear picture was indicated for the experimental cottages.

Temper Tantrum. The variable "Temper Tantrum" was included in the design of the experiment as behavior found to be present in most delinquents (Hewett and Jenkins, 1946). The inordinate display of temper was disruptive and threatning to the staff who also requested the variable be included. No attempts were made to define the term to raters who, consequently, individually interpreted the meaning of the variable. It is probably safe to assume that what one rater saw as a temper tantrum behavior might be reported as uncooperative behavior by another, or that individual raters themselves varied from time to time. It is these kinds of difficulties which, while preserving a real-life setting, reduce precision in attempting to measure changes as they may or may not occur over a period of time. As a result, it may be more meaningful to observe total rate reports for groups at the half way point and at the conclusion of the experiment as more reflective of the effects of a reward system in increasing the incidence rate of behaviors categorized as socially acceptable.

Data accumulated for the entire experiment show a significantly greater report rate of tantrum-like behaviors for the control group than for the experimental group. This difference (over five times greater for the control group)

would seem to indicate that, even though the variable is vague and subject to various interpretations, experimental group subjects were exhibiting significantly fewer socially unacceptable behaviors than the control group and would imply genuine treatment effect. Individual cottage reports show little or no deviation from the first half of the experiment to the second thus not permitting the demonstration of trends. Group data for the first half of the experiment, however, again indicate a significant difference in the incidence rate in favor of the experimental group and lend support to the hypothesis.

Callous. The variable "callous" was included in the design of the experiment at the request of the staff at Gilmary. While no clear definition of the variable was afforded raters, it was generally assumed that behaviors such as cruelty and viciousness fell under the general classification of the variable. The extreme vagueness and lack of definition of the term probably contributed to the very low reported rate of callous behavior. While a statistically significant difference in favor of the experimental group exists for the entire experiment, the total rate is so low as to make questionable the validity of any conclusion. (Only seven reports for both groups were given). It is also not possible to indicate cottage trends due to the vagueness of the term and the extremely low rate of incidence.

Differences between groups at the half way point in the experiment, while again indicating a statistically significant difference in favor of the experimental group, reflect such a low total rate as to make conclusions meaningless.

Thus no clear picture of treatment effect can be shown even though statistically significantly more reports were indicated for the control group.

Sullen. The variable "Sullen" was included in the design of the experiment as a part of the behavioral repertoire found in a significant number of delinquents as reported in the study by Hewett and Jenkins (1946). Further, many of the subjects would, from time to time, become uncommunicative and pout as a result of some real or imagined affront. These kinds of behavior were generally seen as undesirable by the staff and were grouped under the variable "Sullen".

No clear definition of the variable was provided raters. This, plus the vagueness of the term, contributed to variances in interpretation and probably is responsible for the less than conclusive results.

Analysis of data accumulated over the entire length of the experiment reflects a significant difference between groups in favor of the experimental group. This would seem to indicate that even though differences of interpretation

existed concerning an admittedly vague variable, fewer general behaviors labled or unlabled, seen as socially unacceptable were reported for the experimental group.

One experimental cottage had no reports for the entire cottage while the other decreased in reports as the experiment progressed. The decrease is, however, not statistically significant. One control cottage increased in reports as the experiment continued and the other cottage decreased. While the increase was minimal the decrease was statistically significant. It is difficult to draw conclusions regarding trends, however, in light of what has previously been mentioned regarding the lack of definitive procedures and guidelines in identifying the variable.

Comparison of groups for the first half of the experiment again reflects a significant difference in favor of the experimental group. Thus, while showing a significant difference between groups in favor of the experimental group for the first half of the experiment and at the conclusion of the experiment for socially acceptable behavior (however individually intrepreted), it is not possible to demonstrate individual cottage trends. The hypothesis would seem, however, to be supported.

Positive Comments. The daily rating sheet provided a free comment section and raters were encouraged to record

incidences of positive or negative behaviors as they occured. No guideline was indicated to raters, who were free to comment as they saw fit. These free comments were characterized as "positive", "negative" and "non-applicable" by the experimenter an an independent judge and the percentage of agreement was found to be ninety-three percent.

Analysis of data accumulated for the entire experiment shows an overwhelming difference between groups in favor of the experimental group. Individual experimental cottage performances were further analyzed for indications of trends. One experimental cottage decreased in reports as the experiment progressed but the decrease was statistically insignificant. The other experimental cottage increased in positive reports in a statistically significant manner. One control group deviated hardly at all between halves of the experiment while the other decreased significantly in positive reports. Comparison of groups at the mid-point of the experiment shows again that significantly more positive comments were recorded for the experimental group than for the control group. The nature of the variable may lend itself less to misinterpretation between raters. That is, one may assume that less confusion occurs as to what constitutes positive or negative social behaviors than would be the case with the variable "callous",

as an example. The results, therefore, seem especially meaningful and supportive of the hypothesis.

Negative Comments. Comparison of groups for the entire experiment reflects a large and significant difference in favor of the experimental group in the number of negative incidents reported. Assessing individual cottage performance for the first half of the experiment as compared to the second half, however, affords little to indicate trends. One experimental cottage increased insignificantly in the second-half negative reports while the other remained the same. One control group reported significantly fewer negative incidents for the second half than for the first while the other cottage remained virtually constant. Comparison of group performance for the first half of the experiment indicates significantly more negative reports were recorded for the control group than for the experimental group.

Thus, the hypothesis seems to be supported in that fewer negative reports are recorded for the experimental group than for the control group for comparisons at the half-way point and at the conclusion of the experiment. It is not possible, however, to indicate conclusive trends for individual cottages.

Cottage. The design of the present experiment was based upon a twenty-four hour or total motivational environment including school and cottage life. While the basic concept of testing the efficacy of a motivational system based on rewards was held constant, there were some design differences inherently created by school and cottage settings. As an example: the number of raters at the school differed from the cottage; different raters were used in both settings; cottage mothers, who were also the raters, lived with the subjects on a much more personal basis than was possible in the school setting where raters saw the subjects for an average of ninety minutes per day. These differences even though contributing to imprecision, have served to emphasize again the real-life aspect of the experiment which is so basic to the design.

The first part of this chapter dealt with the school setting and indicated general support of the overall hypothesis that there would be an increase in positive behaviors and decrease in negative behaviors for the experimental group. The following discussion includes the activities and behaviors of the subjects as they live their lives in the informal setting of cottage and campus.

Fighting. A matter of some concern to the personnel of the institution was the frequency and severity of actual

physical assults engaged in by the subjects. The variable "Fighting" was thus included in the design of the experiment and was defined as making a physical attack upon another subject and does not refer to verbal arguments. This variable, rather than being vague, refers to behavior which, when it occurs, is not ambiguous and permits for a certain constancy among raters.

Analysis of data for the entire experiment indicates a very impressive difference between groups in favor of the experimental group. The reporting of only two cases of fighting for thirty experimental subjects was a matter of great interest and delight to institution personnel. This was especially true of one cottage mother who, when approached to participate in the experiment declined to do so because "I've seen everything tried and nothing works with this type of girl." This person had thirty years of experience as a cottage mother and only agreed to participate after noting that others were. It is interesting to report that the same individual later became the strongest proponent for the permanent establishment of a motivational system in the institution.

Individual cottage performance precludes the determination of changes between halves of the experiment for the experimental group due to the extremely low incidence rate. One cottage had no reports of fighting for the

entire experiment while the other had two for the first half and none for the second. One control cottage decreased and the other increased in reports as the experiment progressed; neither change was significant, however.

Comparison of groups for the first half of the experiment again indicates a statistically significant difference in favor of the experimental group for the entire experiment. The differences are so large as to suggest treatment effect rather than the effects of novelty. This seems especially true in view of the concrete nature of the variable which does not permit as wide a latitude for individual rater interpretation as is the case with some other variables. The support of the hypothesis in relation to the variable fighting seems impressive.

Swearing. Many more reports of swearing behavior were recorded for activities in the cottages than were recorded for school. Several factors may have contributed to this difference. Raters actually lived with the subjects in the cottages and were consequently together for longer periods of time, and it is probable that swearing behavior was more anxiety-producing for the religious who served as raters in the cottages than for the lay personnel who were the majority of raters at the school.

More reports of swearing behavior were recorded for the

control group than for the experimental group for the entire experiment. The difference, however, is not statistically significant, and no conclusive statement concerning treatment effect can be made. Analysis of individual experimental cottage performance, however, indicates considerably fewer reports were recorded for the second half than for the first half indicating a trend in favor of the hypothesis. The difference indicated is statistically significant for one cottage but not the other. Control cottage performance indicates one cottage increasing in second half reports while the other decreased. Neither change was, however, significant. Comparison of groups for the first half of the experiment, while indicating more reports for the experimental group than for the control group, does not indicate a statistically significant difference. The number of swearing reports for the experimental group decreased during the second half of the experiment, however, further indicating a trend in favor of the hypothesis.

Thus analysis of data indicates that while it is not possible to demonstrate statistically significant differences between groups in support of the hypothesis, it is possible to show trends in favor of the experimental group.

Bullying. Here, as in the school setting, raters were free to individually interpret the variable "Bullying". The vagueness of the variable and the lack of procedural guide-

lines probably contributed to imprecision and magnified problems of measurement. The most that can be said for variables especially subject to individual interpretation is that the results probably indicate the incidence rate of behavior considered socially undesirable. If there cannot be consistent agreement as to the labeling of the actual behavior rated, hopefully all raters would at least agree as to its social desirability.

While more Bullying behavior was reported for the control group than for the experimental group, the differences do not indicate statistical significance. Individual cottage performances for the experimental group indicates one cottage increasing in reports for the second half of the experiment while the other remained the same. The increase, while significant, represents such a low total rate as to disallow conclusions (also it would be difficult to make conclusive statements concerning this or any other variable so vague in nature, since no general definition of the behaviors to be rated was provided and the term in itself would provide less than general agreement between raters) which might not be the case with a more universally understood variable, such as Fighting. Comparison of groups for first-half performance, while reflecting more "bullying" behavior for the control group than for the experimental group, does not indicate significant differences.

Thus, probably because of the vagueness of the variable rated, no conclusive statement concerning the hypothesis can be made.

Loud Talk. This variable probably had less applicability in the cottage setting than in the school setting. While it is feasible to note and record verbal behavior in the classroom which is unappropriate and disturbing in its intensity, the informal and unstructured atmosphere of cottage living provides little in the way of guidelines with which to measure unappropriate loud talk. Inevitably, the individual rater provides her own vague and undefined criteria. One may assume, however, that some agreement between raters would exist as to the social desirability of that which is being rated; i.e. when a report was made, some socially undesirable behavior occured, whether it was labeled Loud Talk, Uncooperativeness, Irritability, etc. Here again precision must be sacrificed for real-life authenticity.

A significant difference exists between groups for the entire experiment. This difference is in favor of the experimental group and seems large enough to indicate support of the hypothesis (more positive and less negative behaviors for the rewarded subjects.) Individual cottage performances for the experimental group reflect a decline in incidence rate as the experiment progressed. The

decline in the case of one of these cottages is statistically significant while the other is not. One control cottage also declined in reports in a significant manner but the other control cottage increased in reports as the experiment progressed. This increase, however, was not statistically significant. Thus, individual cottage performance analysis seems to indicate a slight trend in favor of the experimental group. Control group analysis is less clear. Analysis of data accumulated for groups for the first half of the experiment indicate more total reports for the control group than for the experimental group. The difference is large enough to be significant.

While some imprecision probable resulted due to inability to provide guidelines for interpreting the variable, analysis of all the data indicates general support of the hypothesis.

Impudence. The role of the cottage mother has traditionally been interpreted to include the teaching of respect, discipline and the "Christian virtues". Impudent behavior was a threat to undermine the authority of the cottage mother. While no definition was provided, it was assumed that such behaviors as cockiness and disrespect were included in the variable. Both experimental cottage mothers were instructed in great detail as to the objectives of the experiment and their role in it. Also

discussed were procedures for administering tokens. Emphasized was the fact that socially acceptable behavior should be rewarded immediately whenever possible and that no extraordinary procedures should be instituted for negative behaviors. The limitations imposed on a field study, however, resulted in inevitable deviations from this ideal.

Total negative reports for the entire experiment indicate that far less impudent behavior was shown by the control group. This difference is statistically significant and seems to indicate lack of support for the hypothesis. Data analysis at the end of the first half of the experiment reflects a similar picture. One can only speculate concerning the significance of this difference. Analysis indicates that most of the negative reports were submitted for one experimental cottage while the other experimental cottage compared more favorably with the control group and actually devreased its reports by more than half as the experiment progressed. Further analysis shows most of the reports submitted for the high-rate experimental cottage were for a very few subjects who seemed especially resistant to behavior modification. Also noteworthy is the fact that the cottage mother in this instance had very little experience (one month) and may have been especially vulnerable to "impudent" behavior

as the subjects tested the limits of her authority. It is interesting that this variable is one of two in which control group performance is significantly more favorable than experimental group performance.

Irritable. Almost without exception the subjects of the present experiment were unhappy with their lives at the institution and wanted to "get out" as soon as possible. These feelings of discontent were expressed in many ways, including being moody, testy and generally unapproachable. This, plus the findings of Hewitt and Jenkins (1946) which indicated that a significant number of those adjudged to be delinquent included irritable behavior in their behavioral repertoire, seemed enough justification for the inclusion of this variable in the design of the experiment. Again, no definition of the variable was provided and cottage mothers individually interpreted the variable. While it is recognized that little possibility existed for uniformity of rating procedures between cottage mothers and that conclusive statements concerning "irritable" behavior as such are not always possible, it should also be noted that whatever behavior prompted the recording of a negative report would generally be seen as negative by all the cottage mothers. The reported incidence rates here, as in the case of other poorly defined variables, reflects some behavior

generally considered socially undesirable no matter what that particular behavior is labeled for reporting purposes.

Total reports for the experiment indicate a far greater incidence of socially unacceptable behavior for the control group than for the experimental group. This difference is significant statistically and would seem to indicate treatment effect. Individual cottage analysis reflects a positive trend for the experimental cottages since fewer reports were recorded as the experiment progressed. The difference between the first and second half of the experiment, however, were not significant. Control group cottage performance indicates one cottage decreasing significantly as the experiment continued, perhaps indicating individual rater variations. This seems especially possible since one of the cottage mothers for a control group cottage, while agreeing to participate in the experiment, was less than enthusiastic and tended to be, if not openly hostile, at least rather uncooperative. This rater also tended to see the experiment in terms of other cottages "getting" things (rewards) while hers was not and saw the daily reporting procedure as somehow being a reflection on her performance as a cottage mother. In spite of constant reassurances that the daily report sheet would not be a reflection on her abilities, that the entire process would remain confidential and that

none of the girls would see the reports, the experimenter believes a tendency existed to not report faithfully incidents of socially unacceptable behavior. Again, the vicissitudes of life impinge upon precision.

Group performance for the first half of the experiment shows a significant difference in favor of the experimental group. Thus a trend existed throughout the experiment for fewer reports to be recorded for the experimental group than for the control group, culminating in a very wide and significant difference at the conclusion of the experiment. The hypothesis seems to be supported.

Untidy. The variable was included at the request of the cottage mothers. Every girl was responsible for maintaining her area of the bedroom, laundryroom and kitchen. The quality of housekeeping in these areas plus personal hygiene were included under this variable. Again, no definition was provided and, while not as vague as some other variables, the rate of reports probably can be related to the degree of compulsiveness of the rater. The raters were, however, the "authority" in the cottages and the subjects were required to adjust to the values of the society created by the cottage mothers. Difficulty in this area has often been a prime factor for the necessity of isolating the subjects from the community in the first place.

Analysis of group performance for the entire experi-

ment reflects more reports for the experimental group than for the control group. Performances at the half-way point in the experiment indicate the same trend. In both cases the differences are statistically significant. Individual cottage performances reflect an increase for one experimental cottage and a decrease for the other as the experiment progressed. The decrease was significant while the increase was not. The same pattern exists in the case of control cottages. It is interesting to note that the greatest difference existed in the control cottage with the less than cooperative cottage mother mentioned above. Her cottage decreased by 29 reports as the experiment progressed. One can only speculate whether this decrease is reflective of rater attitude or some other factor. The hypothesis, in any event, is not supported.

Stealing. One of the problems created by the closeness of cottage life, especially in light of the past histories of many of the subjects, was stealing behavior. The matter seemed to be of some concern to institution personnel and the variable was included in the design of the experiment. By definition, this was an especially difficult variable to rate since the opportunity to actually observe a subject in the act of stealing rarly presented itself. What usually occurred was that one girl accused another of stealing some article, and the

cottage mother would act as the mediator in the dispute. Assuming total denial by the accused, the cottage mother would make a "judgement" as she saw fit, probably based on which girl offered the most convincing and persuasive argument or defense. It is at this point that the loser in the dispute usually vented her displeasure by retaliating with some form of socially unacceptable behavior, thus the concern of the staff for this variable is reaction to "injustice" or the frustration created by being "caught" rather than actual stealing behavior.

Total reports for the experiment indicate more stealing behavior for the control group than for the experimental group. The difference, while substantial, is not significant statistically. Individual cottage analysis shows the experimental cottages decreasing as the experiment continued. The decrease for one cottage was significant statistically. It is interesting to note that no stealing behavior was reported for the experimental group for the second half of the experiment. Control cottage analysis indicates no change for one cottage while the other increased, but not significantly. Comparison of groups at the mid-point of the experiment indicates slightly more reports for the experimental group than for the control group. The difference is too small to indicate significance.

Uncooperative. The all inclusive nature of this

variable would seem to make it especially important to the design of the present experiment. Little ambiguity as to the meaning of the term seem possible; one cooperates, does not cooperate, or remains neutral. Recognizing that some difference will exist between raters relative to tolerance levels, it is probably safe to assume that most of the time raters would agree on what constitutes cooperative or uncooperative behavior in a specific situation.

Total reports for the experiment show a large difference in favor of the experimental group. This difference is especially relevant to the hypothesis of the experiment in light of the nature of the variable as mentioned above. Individual cottage trends indicate one experimental cottage decreasing in reports while the other remained relatively stable as the experiment progressed. While the decrease is sizable, it does not reach statistical significance. For control cottages, one increased significantly and the other remained stable as the experiment progressed. Group comparison at the end of the first half of the experiment again reflects a wide and significant difference in favor of the experimental group.

The difference between groups at the end of the first half and at the conclusion of the experiment are so large as to suggest treatment effect as opposed to some other influence, such as novelty, and is definitly in support of the

hypothesis. In spite of the great differences between groups, however, it is not possible to demonstrate trends even though some evidence in favor of the experimental group may be noted.

Temper Tantrums. The intimacy naturally provided by cottage living often provided displays of temper among the subjects. It has also been previously mentioned that most delinquents have been found to include temper tantrum behaviors in their repertoires (Hewitt and Jenkins, 1946). The variable was thus seen as a disruptive force and a threat to the tranquility of cottage life.

The variable was interpreted to include any inordinate display of temper whether provoked or not and whether directed to peers or adults.

A large and significant difference in report rates exists between groups for the entire experiment. This difference is in favor of the experimental group and is large enough to imply treatment effect. It is interesting to note that exactly the same number of total reports (six) were recorded for the school as for the cottage. Many more control group reports were recorded for cottage Tantrum behaviors than for school Tantrum behaviors.

Individual cottage analysis indicates one cottage increasing and one decreasing in rates between halves of the experiment. The total rates are so small, however, as

to preclude positive trend statements. One control cottage decreased significantly in reports while the other increased slightly. Again it is interesting to note that the cottage decreasing in reports is the one with the less than cooperative rater mentioned above. A wide difference exists between groups for comparison of behaviors at the half-way point in the experiment. This difference is statistically significant and is part of the trend in favor of the experimental group which culminated in the wide margin at the conclusion of the experiment mentioned above. Statements about experimental cottage trends are meaningless, however, due to the extremely low total incidence rate. Similarly no conclusions can be made concerning individual cottage trends.

The hypothesis is supported.

Callous. As previously mentioned, the extreme vagueness of the variable "Callous" provides difficulties in precision. While it was generally recognized that such behavior as being extremely cruel, hard and indifferent to the needs of others was included under this variable, perhaps the most that can be said is that some behavior seen as socially unacceptable and which approximated, at least in the rater's mind, Callous behavior was recorded.

A difference exists between groups in favor of the experimental group for comparison over the total experiment

but not to a statistically significant degree. Individual experimental cottages showed one increasing and one decreasing in reports in comparing first half with second half performances. The increasing cottage did so by only one report (from zero reports for the first half) while the other experimental cottage decreased by half as the experiment progressed. This decrease was significant statistically. Both control cottages increased significantly in negative reports in comparing halves of the experiment. Comparison of the groups at the conclusion of the first half of the experiment, however, indicates a statistically significant difference in favor of the control group. This trend, however, begins to reverse itself as the experiment continued and at the conclusion the experimental group had fewer reports than the control group, (although not statistically significant). Thus, while it is not possible to demonstrate significant differences in favor of the hypothesis, the data seem to indicate the expected trend.

Sullen. Here, as in the preceeding variable, vagueness of the term and lack of definitive procedures probably contributed to the less than conclusive results. Sulking, pouting, responding unappropriately to real or imagined "injury" were seen as typical Sullen behavior.

Almost identical totals were recorded for Sullen

behavior over the course of the entire experiment for both groups, indicating no support for the hypothesis. Individual experimental cottage analysis shows both cottages decreasing in reports as comparison is made between halves of the experiment. In both cases, the decrease is statistically significant and indicates a trend in favor of the hypothesis. One control cottage decreased significantly while the other did not. Comparison of groups at the conclusion of the first half of the experiment shows almost identical rates for both groups with slightly more reported for the experimental group.

While no support for the hypothesis is indicated through analysis of the data, there seems to be a trend reflected in favor of the hypothesis.

Charges. Every girl in the institution was required to perform assigned household tasks referred to as "Charges". Washing windows, waxing floors, doing laundry, ironing, dusting and similar tasks are examples of cottage responsibilities. These tasks are traditionally seen as distasteful duties and complaining and manuvering to get out of doing Charges is a common pastime. Cottage mothers were especially interested in increasing the quality of charges performed. As a result, the variable was defined as not only performing the assigned task, but performing it

willingly and to the satisfaction of the cottage mother.

Here finally is a concrete variable with little room for the imprecision so common in many of the more vague ones. Also, there is an opportunity to observe behavior initiated or volunteered by the subjects as extra charge lists are placed on the bulletin board.

While charges were assigned as cottage responsibility, performing household chores at the school was usually reserved and meted out as punishment for infractions of school rules. During the experiment, however volunteer lists were posted on the bulletin board listing chores such as mopping halls, sweeping classrooms, cleaning the lavatory, waxing the floor, etc. The subjects were not promised rewards for volunteering nor criticism for not volunteering. A pattern developed almost immediately and continued as the experiment progressed. All charges on the list were immediately signed for by girls in the experimental group; some signed for as long as two weeks in advance. Competition developed as girls sought to sign for jobs seen as favorable. These tasks were accomplished only during free time and pleased the principal who usually served as token dispenser. Subjects learned not to attempt to negotiate payment for completing a chore as tokens would be quietly withheld. Sometimes complaints of not having been rewarded for doing a task were handled by explaining that injustices sometime

occur in life to all and that continued effort was sure to be recognized and rewarded. A special effort was made in these cases to observe and immediately reward any socially acceptable behavior performed by the subject.

Experimental group subjects also volunteered services in the dining hall, helping in the many chores usually associated with such facilities. Girls volunteered to wash the automobiles of the staff, who cooperated as they cared to. At one point in the experiment a complaint was brought to the experimenter that candy wrappers, gum wrappers and other evidences of the "canteen business" were littering the campus. Immediately the "price" of these articles was doubled as subjects were required to pay 4 or 6 tokens per article rather than 2 or 3. A loud cry of anguish arose as subjects demanded an explanation for this sudden "inflation". Upon hearing the cause of their dilemma, many subjects were seen policing the area. The next day prices were returned to normal and the littering problem was solved to everyones satisfaction.

Another example of gaining cooperative behavior from experimental group subjects occurred in the dish washing room of the dining hall. The noise level in this area was very high as the cacophony of sound generated by the handling of dishes and trays joined with the raised voices of those working in the room. The Mother Superior of the

institution complained that the noise was very disturbing to the Sisters, whose private dining area immediately adjoined the dish room, and asked that something be done about the situation. Conveniently, experimental cottages were assigned the dish washing chore when this request was made. The cottage mothers were advised of the dilemma and suggestions were made in procedures designed to reward "quiet" handling of utensils and in refraining from loud conversations in the dish room. The noise level dramatically decreased with the result that the Mother Superior, who until this point had remained aloof from all phases of the experiment, was duly impressed. A dramatic and easily discernable change also occurred in the behavior of experimental group subjects as they passed through the serving line. Up to this point, jostling, loud talk and general horseplay was the usual form of behavior as the girls relaxed in the informal atmosphere of the dining hall. Cottage mothers were trained to stand at the end of the line and observe the behavior of the subjects as they passed through. Passing through in what was determined to be a socially acceptable manner was rewarded by placing a token on the girls tray as she went by. If the subject said "thank you" another token was placed on her tray. It soon became apparent which girls belonged to the experimental group. Cottage mothers were also free to move about the dining hall

and place tokens on the tray of those who were "conducting" themselves properly by employing proper dining hall procedures as they enjoyed their meal.

Comparison of groups for the entire experiment indicates a great difference with over three times as many reports of uncooperative behavior recorded for the control group. The margin of difference is statistically significant and large enough to suggest treatment effect. Individual cottage analysis shows one experimental cottage decreasing by more than half in comparing first half performance with second half performance. The other experimental cottage remained relatively stable for the two periods. It is thus difficult to state conclusively that a trend toward significant decrease in reports as the experiment progressed was indicative of treatment effect. One control cottage remained rather stable while the other increased significantly in reports in a similar comparison. Again, a very large and significant difference existed between groups as they were compared at the conclusion of the first half of the experiment.

A truly impressive difference between the total uncooperative reports for the control group and the experimental group is apparent. This difference, large at the half-way point but even larger at the conclusion of the experiment, reflects group trends. It is not possible, however, to

demonstrate statistically significant trends for individual experimental cottages even though a slight positive trend is noted. The hypothesis is impressively supported.

Positive Comments. A free comment section was provided on the daily rating sheets and raters were encouraged to record "positive" or "negative" statements concerning behavior occurring anywhere on or off campus.

The number of positive reports recorded for the experimental group was over six times greater than the number reported for the control group. The difference is significant statistically and is vital to the hypothesis. It is not possible, however, to demonstrate individual experimental cottage trends since both cottages decreased in reports. The difference in the case of one cottage between performance for the first half of the experiment as compared to the second half is statistically significant while the decrease for the other cottage is slight and consequently insignificant. Analysis of individual control cottage performances indicates decreases since fewer positive reports were recorded for the second half than were recorded for the first half. One cottage difference is significantly statistically while the other closely approximates significance. The trend for control group cottages is thus demonstrated to be in the direction of fewer positive reports.

Analysis of data for the first half of the experiment

indicates that a significantly greater number of positive comments were recorded for the experimental group than for the control group. Thus, while individual experimental cottages do not demonstrate positive trends, the entire experimental group seems to move in this direction as a greater number of positive comments are recorded as the experiment progressed. The hypothesis is supported.

Negative Comments. As with the preceeding variable, a free comment section was provided on the daily rating sheet for comments. These comments were categorized as positive, negative or neutral by the experimenter and an independent judge who agreed ninety-three percent of the time in their independent ratings.

Analysis of group data accumulated for the entire experiment indicates over three times as many negative reports were recorded for the control group. This difference is statistically significant and seems to indicate treatment effect. This indication is reinforced when joined by the results of the preceeding sections which reflected a difference in favor of the experimental group in the number of positive comments made.

Performance trends of individual cottages show that while one experimental cottage remained rather constant in reports for the second half of the experiment as compared to

the first half, the other cottage decreased dramatically and significantly to zero reports for the second half. One control cottage increased while the other decreased in reports as the experiment progressed. Neither change was significant, however.

Group comparison at the end of the first half of the experiment again reflects a significant difference in favor of the experimental group. A trend toward decreasing negative reports is thus indicated for the experimental group as the experiment progressed. This, plus the significant differences existing between groups in the total number of positive and negative comments recorded, lends strong support to the hypothesis.

"Subjective" vs. "Behavioral" Variables. Frequent mention has been made of the difficulty inherent in the attempt to measure behavior where no universal definition of the behavior to be measured is possible. One must generally agree as to the exact nature of the behavior to be changed before meaningful measures of such change can be accomplished. Such behaviors as Callous and Sullen, for example, seem too vague to allow true measures of change. Other variables, however, such as Fighting and Charges are more concrete in nature and leave little room for individual interpretation as to their meaning.

The variables Callous, Sullen, Impudent and Bullying were categorized as being vague while the variables Tardy, Fighting, Stealing and Charges were seen as behavioral. Comparison of rates of incidence and computation of chi square was accomplished in an effort to determine if any patterns existed concerning the two kinds of variables. Theoretically, support of the hypothesis would be found in greater differences being recorded in favor of the experimental group for the more behavioral variables than for the variables more vague in nature.

Analysis of data, did, in fact, reveal such a difference in a striking way. The incidence rate for the behavioral variables indicated a much greater difference in favor of the experimental group than the vague variables did. Again support of the hypothesis is demonstrated.

B. OVERALL EVALUATION OF STATISTICAL ANALYSIS

Thus statistical evidence is consistently in favor of the basic research hypothesis for 10 of the 12 variables associated with activities at the school. Similarily, cottage activities reflected in favor of the experimental group significant differences for 9 of the 15 variables measured. A total therefore of 19 variables were shown to exhibit a significant difference in favor of the experi-

mental group in terms of the number of socially unacceptable behaviors, as defined by the institution (of a total of 27 variables measured for the entire experiment).

The results seem meaningful even in view of lack of precision in controlling and measuring variables. Testing the relevancy and applicability of a motivational system under real life conditions has advantages which were felt to outweigh disadvantages. Delinquent girls must function in the social settings created by the institutions to which they are committed. Experimental procedures, to be relevant, must also be applied to the same kinds of open settings, precluding the type of control and precision usually associated with experiments conducted under laboratory conditions and closed social situations.

C. ANALYSIS OF IMPRESSIONISTIC FACTORS

Attitudes of Raters. There is more than the question of precision or of the significance of statistical results to suggest the efficacy of a motivational system based on operant conditioning techniques in a school for delinquent girls. There are in all field studies variables which cannot be separately described but which collectively serve as subtle indicators for or against the hypothesis. Sensitivity of personnel to mood and attitudinal changes born of years of experience with delinquent girls may be significant but

unmeasurable, for example. While these kinds of reports were not overtly solicited, a daily diary was kept by the experimenter to record them when they did occur.

Many institutional personnel were philosophically opposed to the concept underlying the experiment. It seemed incongruous to some of the religious personnel that teen-agers should be paid for behaving properly rather than receiving their reward out of knowledge that such behavior had found favor in the eyes of their superiors and their God. Others, while not openly opposing the design of the experiment, were pessimistic as to expected results on the basis that "everything" had been tried over the years and little beyond custodial care could be provided while optimistically waiting for something to happen, whether it be religious "insight" or the processes of "Maturation", which would aid the young lady to see the error of her past behaviors and hopefully induce her to behave in more socially acceptable ways.

Significantly apparent in this respect was the skepticism of one of the experimental cottage mothers whose experience with delinquent girls spanned a thirty year period. Some concern that her attitudinal prejudices would work against and serve to contaminate the design of the experiment in the manner of a self-fullfilling prophecy were dispelled as this person became, within a period of

three weeks, the most enthusiastic member of the institution in favor of the rewards system. This person was so impressed by the changes apparent in the behavior patterns of her charges that she suggested the entire population of the institution continue with the reward system at the conclusion of the experiment as a regular part of life at Gilmary. The Mother Superior of the institution was subsequently petitioned by all four cottage mothers and permission was granted to continue the motivation system for the entire population, not as an experiment, but as a regular part of the routine of the institution. In another case, opposition to the experiment seemed to be based on anxieties over comparison of cottages. This person, a control group cottage mother, evidenced some insecurity over her position in the hierarchy of the institution and interpreted the performance of her charges as reported in the daily reports as a reflection on her abilities as a cottage mother. Conflicts between incidents in the cottage as freely told by control subjects and the reporting or lack of reporting of the incident sometimes occurred. Even though such instances invariably occurred in favor of the control cottages, no effort was made to alter any report of any rater. Thus the results of the experiment seem even more impressive.

The normal activities of the institution seemed to be

divided into two broad areas: school and cottage life. It would seem appropriate to comment concerning the impact of the experiment upon the lives of the subjects and personnel in these separate areas.

School.

Canteen. The first few days of the experiment were spent generally in attempting to adjust to the "system". Great curiosity concerning the canteen plus a certain initial hostility on the part of the control group subjects was apparent. These feelings subsided, however, and a routine was rapidly established. Canteen hours were from 9:00 - 9:30 A.M. and 4:00 - 4:30 P. M. Every effort was made to stock items in the canteen especially desirable to teen age girls. Perfumes, cosmetics, stockings, hair ribbons, sweaters and jewelry of all discriptions were some of the items. Cigerettes were very important as reinforcers and many brands were stocked.

Relatively few girls used the canteen during the first days of the experiment. This may have been due to a certain time period being necessary to accumulate tokens plus uncertainty and suspicion as to what the "catch" was. Very rapidly, however, it became apparent that the canteen was to be taken seriously and the volume of business

increased tremendously up to and including the last day of the experiment. It often was necessary to replenish supplies as subjects accumulated large numbers of tokens.

It was sometimes possible to use the canteen as a source of reward in itself. Occasionally a subject would accumulate enough tokens to make a rather substantial purchase for a friend's birthday or for a cottage mother's "Feast Day". The unselfishness of the subject would be rewarded in these cases. Subjects also were rewarded for sweeping and dusting the canteen. This activity soon became very desirable and some competition resulted. Often subjects would share their tokens, permitting another to make a purchase. They were often themselves rewarded. Experimental group subjects were required to wear an attractive red ribbon on their shoulders to aid raters identify those permitted to receive tokens. Since the canteen was the first activity of the school day, opportunity presented itself to observe and reward those wearing their ribbons. The close proximity of primary reinforcers located in the canteen served as an added incentive to gain these "on the spot" rewards. Often one could observe subjects lending their ribbons to forgetful friends.

The total impression gained from activities in the canteen was one of great acceptance and expectation. The subjects truly enjoyed, if but for a short period each day

the relative privacy and the many otherwise unattainable luxuries provided by the canteen.

Control Group Subjects. Little has been said to this point concerning the morale of the control group. Initially, some resentment existed and the subjects demanded an explanation to their charges of favoritism. Gradually feelings of resentment seemed to be replaced by grim determination to be patient until their turn to "get things" came. It was incomprehensible to many of the control group subjects that anyone would be so unfair as to play obvious favorites by rewarding some cottages for "good" behavior while not rewarding the others. Also the Chaplain of the institution reinforced this hope of better things to come by announcing to the control group cottages that "your turn would come in the very near future." This entire attitude of expectancy was seen as a potentially serious threat to the design of an experiment which could ill afford further contamination. It was necessary to inform the Chaplain, control subjects, and all others who seemed to be misinformed that there was no plan ever to reward control subjects. By the time the entire reeducation process had been accomplished a routine had established itself and no overt hostility or resentment was obvious for the remainder of the experiment.

Control group subjects were not permitted admission

to the canteen and, for the most part, little difficulty was experienced in adhering to this rele. Control subjects would, however, occasionally loiter in the hallway immediately adjoining the canteen, sometimes causing confusion. Experimental group subjects sometimes would share their candy or food with control group friends who would wait in the hallway. A rather humorous dilemma thus presented itself whereby the experimenter felt compelled to reward generosity, but hesitated to contaminate the design of the experiment. The problem was usually resolved by ignoring the entire incident.

Classroom Activities. Classes were structured to last 90 minutes each, with a fifteen minute free period at the end of 45 minutes. Subjects were free to leave the room, socialize in the halls, go to the rest room, etc. during this period. A bell would sound signaling the end of time periods. The experimenter was free to move from one class to another on an unannounced basis. Experimental subjects were often rewarded as classes were in progress. The experimenter dispensed tokens, as an example, to girls who seemed to be diligently at work, or to those who seemed to be especially cooperative towards teachers or peers.

The principal of the school reported that the attitude of the subjects had noticeably changed and that the general

atmosphere of the school was dramatically different. Especially apparent and interesting was the fact that very often many experimental subjects decided to remain in their classes rather than take their fifteen minute break. This in itself, according to the principal, was revolutionary in comparison with past experiences. The comments of the social worker who worked with the subjects during the regular school year were also favorable to the hypothesis of the experiment.

Cottage. Opportunities were provided experimental cottages to purchase items after the regular canteen hours. Cottage mothers were happy to cooperate in the operation of "branch" canteens for their charges. Especially popular was the opportunity to purchase pizza as a late night snack. Normal activities at the cottage provided many opportunities to earn tokens. Cottage mothers were carefully instructed to reward immediately any socially acceptable behavior whether it be kindness to peers, an especially well made bed, or volunteering to do extra chores. Subjects soon were earning so many tokens that security became a problem. Cottage mothers agreed to serve as bankers for the girls and evolved a system of accounting and security which included accumulating cereal boxes for the girls to hold personal accounts. Tokens were conveniently kept in circulation by changing smaller denominations thus accumulated for larger ones.

Many dramatic incidents were informally reported to the experimenter. On example is the case of a rather hard and bitter young lady who had been in the institution for approximatly one year. This subject had never been observed being especially cooperative or warm towards her peers, holding herself aloof from cottage activities. The young lady approched the cottage mother for permission to awaken at an unusually early hour one particular morning. Permission was cautiously granted. The next morning girls of the cottage were pleasantly surprised to find their breakfast waiting for them on neatly set tables, compliments of a formerly unapproachable member of their group. Tokens were, of course, given as rewards. More important in this case, however, was the social reinforcement offered by the girls as they fussed over the incident.

D. SPECIAL REINFORCERS

While the facilities of the canteen and cottage "branches" were utilized to a great extent, very little attention was paid to opportunities to attend drive-in movies, go to outside restaurants or enjoy free time in a special lounge. Perhaps prices were too high and required the discipline imposed by the necessity to save up rather large amounts of tokens. This may have been

especially difficult for most subjects in view of the many tempting items available for more immediate gratification.

E. BIASES

Theoretically, random assignment of subjects to groups served to minimize biases. Further, the performances of groups during the first days of the experiment tended to indicate equality of groups. However, while it was possible to demonstrate differences between groups at the half-way point and at the conclusion of the experiment, it has not always been possible to show these differences occurring in a constant trend-like fashion for individual cottages. This difficulty, it is felt, was due primarily to the fact that variables were not defined for raters, and, lacking definition of behaviors, there could be no constant extinction process. What is interesting, of course, is the great number of instances in which the control group reports far exceed the experimental group reports.

A factor which cannot be discounted in interpreting the results of the present research is the influence exerted upon experimental group subjects by identifying and treating them differently from the control subjects. The expectation that changes would occur may have been

crucial in determing the final results in the manner of the Hawthorne Effect (Maier, 1955). It should also be recognized, however, that while the total process of choosing certain subjects to be rewarded can in itself be seen as a socially rewarding event, the results of the large number of variables measured plus the fact that experimental subjects were not held constantly separate from control subjects might tend to minimize global effects. In any event, whatever seems appropriate to modify delinquent behaviors, including the placebos of the Hawthorne Effect, should be given consideration.

F. SUGGESTIONS FOR THE FUTURE

Experience gained from the present research would seem to suggest certain alterations in the design of further research in this area. While it is not feasable nor desirable to alter the overall structure of the environment in which subjects are required to function, it is possible to tighten the design of the experiment to better facilitate more meaningful results. A longer experimental period, for example, would permit cottages to serve alternately as experimental and control cottages. Statistical data reflecting performances of cottages first as experimental groups then as control groups could be compared. The time element involved would, of course, need to be long enough

to permit treatment effects and opportunities for these effects to extinguish as the cottages changed their roles.

It would also be more meaningful to limit the number of variables to be measured to behaviors which are concrete and universally understood. Training sessions concerning clear definition and uniformity of interpretation should be conducted before and during the experiment. At this time the role of the raters could be explained and anxieties concerning personal rater comparisons could be dealt with.

Future research would also gain by providing greater accessibility to primary reinforcers by structuring longer periods of canteen time. Ideally, the Canteen should be open every day and should include the evening hours.

The desire to please the experimenter may have been a factor in the final determination of the results especially since an agreeable relationship existed between the experimenter and the subjects prior to the beginning of the experiment. Future research would probably benefit from the use of experimenters not previously known to the subjects, contributing fewer factors which may be potentially prejudicial to the design of the experiment.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The present research was designed to test the applicability of operant conditioning techniques in the modification of behavior in delinquent girls in an open institutional setting. The experiment was conducted at a residential institution operated by members of a religious order.

The experiment was designed to last for a period of eight weeks during the summer recess from the normal school year. The regular summer program, including classes in sewing, cooking, typing, physical education and art, functioned along with normal cottage life, as the experimental milieu. No effort was made to interfere with the administrative, ethical, or philosophical biases of the institution, preserving as much as possible the real-life dimension of a field study.

Thirty subjects were randomely assigned to the experimental group and thirty were assigned to the control group. Experimental subjects, identified by a red ribbon worn on the left shoulder, were rewarded for socially acceptable behavior. Tokens were dispensed as secondary reinforcers which could be accumulated or spent immediately on a wide variety of primary reinforcers. A special Canteen

was constructed to contain these reinforcers (which included such items as cigarettes, candy, ice cream, books, jewelry wearing apparel and many more products desirable to teen-age girls).

Personnel of the institution were required to individually determine the desirability of behavior performed and to administer rewards accordingly. Socially unacceptable behaviors found to be in the behavioral repertoire of most delinquents (Hewett and Jenkins, 1946) and behavior peculiar to the institution as identified by the staff served as the basis of the rating system. Variables thus identified were rated daily.

Five teachers and four cottage mothers submitted daily incidence rate sheets indicating observed negative behaviors. Provisions were also provided for reporting positive and negative incidents. Data were accumulated and chi square computed to determine differences between experimental and control groups.

Results indicated that significantly fewer negative incidents were recorded for the experimental group on 19 of the 27 variables measured. Significantly more positive and fewer negative reports were also freely recorded for the experimental group. Thus support for the basic hypothesis, i.e., that there would be more positive and fewer negative behaviors reported totally for the experimental group than

for the control group, was demonstrated. It was noted that differences were even greater for variables which were more behaviorally definable than for those which were of necessity, more vague.

The basic hypothesis was supported for almost all variables measured. In addition to statistical evidence, the consensus of opinion of institution personnel was that an observable difference in attitudes and behaviors existed between experimental and control group subjects. This factor seems especially important in view of initial opposition to the philosophy inherent in the experiment. The entire population, subjects and staff, agreed to the desirability of a motivational system based on a token economy. Subsequently the reward system was continued as a regular routine at the institution after the conclusion of the experiment.

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APPENDIX A

D A I L Y R E P O R T

CLASS:_____ TEACHER:_____ DATE:_____

NAME	Tardy	Swearing	Bullying	Loud Talk	Impudent	Irritable	Uncooperative	Temper Tantrums	Callous	Sullen			COMMENTS

DAILY COTTAGE REPORT DATE:_____ COTTAGE

NAME	FIGHTING	SWEARING	BULLYING	LOUD TALK	IMPUDENCE	IRRITABILITY	UNTIDINESS	STEALING	UNCOOPERATIVE	TEMPER TANTRUMS	CALLOUS	DOING CHARGES	SULLENNESS	COMMENTS

EXPENDITURES

Total expenditures for the experiment are difficult to estimate because of the large number of donated articles. A minimum of $700.00 was, however, directly spent on experimental costs, ranging from construction materials to purchases of foods and cigarettes. It is also estimated that donated articles amounted to approximately $600.00.