THE UNIVERSITY OF MANITOBA

AN EVALUATION OF THE RELATIVE EFFECTS OF ADULT AND PEER PRAISE ON THE PERFORMANCE OF INSTITUTIONALIZED RETARDED FEMALES

by

Larry M. Hardy

A Thesis

Submitted to the Faculty of Graduate Studies

In Partial Fulfillment of the Requirements for the Degree

of Master of Arts

Department of Psychology

Winnipeg, Manitoba

October, 1972

ABSTRACT

The purpose of the present study was two-fold: (1) to determine whether differential reinforcement effects could be obtained for adult and peer praise on a criterion task with retarded subjects, and (2) to determine whether the effect of peer praise could be enhanced by pairing the peer and/or peer praise with a proven effective reinforcer.

The evaluation of the differential effects of adult and peer praise was the purpose of Phase I of the study. This involved a comparison of key pressing response rates of four institutionalized retarded subjects under three experimental conditions: (1) peer praise sessions, (2) adult praise sessions, and (3) free operant sessions. Results indicated that for two of the four subjects adult praise was reinforcing. Peer praise was reinforcing for only one of these two subjects, although the effect was slightly less than that obtained for adult praise. Of the two remaining subjects, one subject showed no reinforcement effects for either adult or peer praise, although responding for peer praise was greater than for adult praise. The fourth subject was involved in an experimental probe which entailed verbal prompting of key pressing. Neither adult nor peer praise showed any reinforcement effects during the probe study. No further experimentation was conducted with the fourth subject.

The purpose of Phase II was to evaluate the effects of pairing the peer with the presentation of adult praise on subsequent peer praise sessions. Only one subject participated in Phase II. Results indicated

that although overall responding increased for all conditions, the relative influence of peer praise was not enhanced by pairing the peer's presence with adult praise.

The purpose of Phase II was to evaluate the effects of pairing peer praise with candy reward on subsequent responding during the peer praise sessions. The three remaining subjects participated in phase III. In Part (a) of Phase III the reinforcing effect of candy reward for two subjects was established. The third subject was suspended from further study because of destructive behavior that occurred after candy reward sessions. In Part (b) of Phase III, peer praise was paired with candy reward for the two remaining subjects. Although responding for peer praise increased for both subjects, relative to previous phases, corresponding increases in response rates during the free operant sessions led to the conclusion that the relative effects of peer praise was not enhanced to a level that could be considered as reinforcing.

In addition, during Phase III, manipulations were made to determine whether differential reinforcement effects could be obtained in the adult praise condition by introducing a different adult reinforcer. This manipulation was conducted on two subjects, and differential reinforcement effects were found in both cases.

Plausible reasons for the obtained results were discussed along with suggestions for future research in the area of social reinforcement with institutionalized retardates.

ACKNOWLEDGEMENT

I wish to thank the members of my committee, Dr. G. L. Martin, Dr. J. Pear and Dr. G. Lawther. Grateful acknowledgement is also due to the staff at the Manitoba School for their excellent cooperation and to Judy Adelmen who assisted in the collection of data for the study.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The following research concerns the study of some of the variables that may influence the development of social behavior in the severely retarded. Severe retardation refers to those individuals having an IQ score within the range of 20 to 35. Previous research in the field of mental retardation has demonstrated the successful use of operant conditioning techniques in the training of self-care skills with this classification of retarded (Martin, Kehoe, Bird, Jensen, and Darbyshire, 1970; Martin and Treffry, 1970; Treffry, Martin, Samels, and Watson, 1970; Martin, England, and England, 1971).

In these studies severely retarded children were trained to perform the self-care behaviors in question. The goal of the research described in these articles was to develop behaviors in the severely retarded that may eventually enable them to function as independently as possible in an institutional environment.

One area of behavioral research among the severely retarded that has received rather limited attention has been research concerning the development of social or cooperative behavior. It is one step towards institutional independence to train these children to dress themselves, to name pictures and objects, to follow commands, etc. in a classroom or controlled ward situation. However, this goal may be further enhanced if the severely retarded could be trained to emit these behaviors in the presence of only their peers, for the rewards that their peers may be able to offer. In other words, what is needed is the development of

social interaction for social reinforcers among retarded peers to the extent that the interaction will be maintained in the absence of the presence and/or reinforcement from adult staff. It is towards this end that the following research is directed.

CHAPTER II

REVIEW OF LITERATURE

A. Theoretical Analysis of Social Behavior

Skinner (1953) defined social behavior as "the behavior of two or more people with respect to one another, or in concert with respect to a common environment". This behavior arises because an organism is important to another as part of its environment; the environment being one of the major influences on behavior. Because of this, an analysis of the social environment and any special features it may possess is a necessity in the understanding of human behavior.

In the realm of social behavior, special emphasis is placed upon reinforcements with attention, approval, affection, etc. These important generalized reinforcers are social because the process of generalization usually requires the mediation of another organism. Skinner noted that many reinforcements require the presence of other people. In some of these another person participates merely as an object, as in certain forms of sexual and aggressive behavior. However, for the most part, social reinforcement is usually a matter of personal mediation (e.g. when a mother feeds her child, food, as a primary reinforcer, is not social, but the mother's behavior in presenting it is).

Ferster (1958) noted that most of the behavior of organisms exists because of its effect on the environment, i.e. that behavior results in some kind of consequence. If, as a result of that consequence the behavior increases in frequency, that consequence is said

to be a reinforcer. According to Ferster, most human behavior is social because it has its effects on other organisms, who in turn arrange the reinforcements. This is in contrast with the physical environment which reinforces directly. The same reinforcement paradigm may be extended to larger groups of people, social institutions and agencies, less well defined groups involved in social practices, small groups and/or neighbourhood gangs of children. These social practices ultimately refer to a set of reinforcements and punishments which the people who constitute the social agency or practice apply to the behavior of an individual. The social situation is unique only insofar as other organisms mediate the reinforcements and punishments or other important environmental effects.

A fundamental psychological analysis of social behavior must deal with the behavior of an individual. The functional dimensions of social behavior appear only when they are expressed in terms of the consequences that the members of a group of people arrange for an individual. Social approval, for example, refers to a high disposition to supply favourable consequences to a wide range of specific behaviors of the individual, and conversely, a low disposition to arrange punishments. Ferster noted that the major processes of behavior provide the technology for generating and/or eliminating behavior in the individual and as such are basic to the analysis of social effects. However, it must be assumed that the processes and laws operating in social situations are the same ones which are basic for all behavioral processes.

Bushell and Burgess (1969) reiterated the same theme noting that the relationships between a behavior and its consequence constitute the basic laws of behavior. These are generally expressed in the form of

statements of contingencies. That is, certain changes occur in the environment contingent upon the emission of certain operants in certain patterns. Whether established by nature or by the social environment, these patterns may take on various arrangements, each of which has a characteristic and predictable effect upon its related operant. Responding is a lawful function of these arrangements which are called schedules of reinforcement.

However, Skinner (1953) pointed out a relevant and interesting aspect of social reinforcement; mainly that behavior reinforced through mediation of other people will differ in many ways from behavior reinforced by the mechanical environment. In natural settings, social reinforcement varies from moment to moment, depending upon the condition of the reinforcing agent. Different responses may therefore achieve the same effect, and one response may obtain different effects depending upon the occasion. As a result, social behavior is more extensive than comparable behavior in a non-social environment. It is also more flexible in the sense that the organism may shift from one response to another when its behavior is not effective. Because of these factors and since, in many instances, the reinforcing organism may not respond appropriately, social reinforcement is likely to be intermittant. The resultant effect of social reinforcement will therefore depend upon the schedule of reinforcement the organism is subjected to. An occasional success may fit the pattern of variable interval reinforcement, and the behavior may show a stable intermediate strength.

Ferster (1958) reinforced this position, stating that the nature of the intermittancy (of social reinforcement) has a great influence on the disposition to engage in a given behavior. The history by which

an individual is exposed to a given schedule is of great importance. Certain schedules of reinforcement will sustain behavior normally if approached in gradual steps; but if the organism is exposed to the final schedule at once, complete cessation of behavior may result. An optimal schedule of reinforcement in one area will help sustain performance under a less optimal schedule of reinforcement in another area; and conversely, a non-optimal schedule of reinforcement may have the opposite effect of weakening a repetoire whose schedule of reinforcement is more optimal.

B. Research of Social Behavior and/or Social Reinforcement

During the past decade there has been an ever-increasing research interest in social behavior and with reinforcement variables as related to social behavior (for sample articles see Ulrich, 1966, Bijou and Baer, 1967). In many of the studies presented a stimulus-response (S-R) orientation towards research may be found. Observed behavioral changes were explained in terms of incentives, or reinforcers, avoiding reference to intervening processes, such as volition, information processing, consistency, etc. This orientation allows one to devote attention to what may be a central problem of psychology; namely identifying those potentially manipulable environmental events to which behavior is ultimately a function. The fact remains that the behavior of the human organism is functionally related to stimuli from his past and present environment and no comprehensive account of performance will be attained until this relationship is understood.

Given an operant orientation towards research, one may describe social behavior as operant behavior; social behavior occurs in the presence of some relevant stimulus and results in some kind of con-

sequence. By describing this process in as purely behavioral terms as possible one emphasizes and permits an objective analysis of specific performances and their outcomes. It is with this orientation in mind that the literature under review will be presented, evaluated, and, where necessary, criticized.

External Control of Social Behavior

Azrin and Lindsley (1956) demonstrated the development of a form of social behavior (cooperative responses) in young normal children. This development resulted from the incorporation of specific reinforcement contingencies for cooperative behavior. Pairs of children played a game that required each child to place a stick in one of three holes in a table top. When both children inserted their sticks into opposing holes at the same moment, they were rewarded with a single candy. Without specific instructions (re making cooperative responses) ten pairs of children learned to make cooperative responses within ten minutes.

The acquisition and extinction curves presented in this article show an orderly relationship between the cooperative behavior and the reinforcers it produced. When the reinforcement was terminated the frequency of cooperation declined, and when reinforcement was reinstated, cooperative responses increased. These results demonstrate that cooperative responses or behavior need not be the result of either intention or instruction, but can be shaped through the manipulation of environmental variables.

Baer and Sherman (1964) offered another example of external control of social behavior. Specifically, the control of social reinforcement over generalized imitation of young, normal children was

presented. Acknowledging the tendency for young children to imitate certain behaviors of adults and other models, the authors utilized a "talking Puppet" to serve as a model for pre-school children. The model said "good" or "fine" whenever the child imitated certain verbal or motor responses. However, the puppet did not reinforce the subjects for pressing a bar, a response which it periodically presented to the children. Seven of the eleven subjects studied pressed the bar when the puppet supplied the cue to imitate, even though no reinforcement was applied for this imitative response. However, with the termination of reinforcement for the other previously reinforced imitative responses, the frequency of imitative bar pressing decreased. Although no verbal cues were given in regards to imitating the bar press response, the dependant variable proved to be subject to the influence of external control; in this case to social reinforcement of other behavior.

The studies by Azrin and Lindsley and Baer and Sherman (1964) present two points that will be repeatedly demonstrated in many of the studies to follow: (1) that social behavior, like any other behavior is subject to the influence of external control; and (2) that social reinforcement may be considered an environmental variable which can potentially influence behavior.

Analyses of Social Reinforcement with Normal Children

Gerwitz and Baer (1858a) evaluated the functional relationship between the effectiveness of a social reinforcer and the immediately preceding social experiences (level of social deprivation) of the receivers of the reinforcer. In this study, children were either deprived, not deprived, or satiated of social approval before playing a game that involved dropping a marble into one of two holes. Following

a four minute period during which the experimenter observed the child's preference for one or the other hole, reinforcement in the form of "Good", "Mm-hmmm" and "Fine" was given whenever the child dropped the marble into his least preferred hole. Social reinforcement was much more effective in modifying the subjects' behavior when they had been deprived of social approval during the twenty minute pre-experimental period than under any of the other conditions. Thus, according to the results of this study, it may be interpreted that behavior reinforced socially is influenced by deprivation and satiation variables in a similar fashion to those behaviors reinforced by primary reinforcers like food.

The forementioned study was a replication and extension of a previous study conducted by the same authors, (Gerwitz and Baer, 1958b), in which the effects of deprivation and non-deprivation were evaluated. The differential effects of these two conditions were reflected in the reinforcing effectiveness of the adult's approval. The effects of social reinforcement have also been demonstrated in several other studies using verbal stimuli, appealing to the concept of approval as reinforcers (e.g. Greenspoon, 1955, Chase, 1932).

Following the Gerwitz and Baer 1958a study, Dowart, Ezerman, Lewis and Rosenhan (1965) experimentally analyzed whether social or non-social reinforcers would more effectively maintain behavior following brief social deprivation. They cited research in which social reinforcement was found to be more effective than non-social reinforcement with younger boys. However, they noted that in these cases the experimenters' preliminary behavior could be described as relatively aloof, thereby providing a form of social deprivation similar to that

produced by Gerwitz and Baer (1958a). In the Dowart et al. (1965) experiment, either social deprivation or social satiation was induced by having the experimenter behave in either an aloof or friendly fashion as he was leading the child to the experimental room. The subjects were instructed to play a game involving two alternative responses. One response was subject to reinforcement, social for one group in both conditions and non-social (an illuminated light) for the remaining group in each condition. The investigators reported that the subjects who were socially deprived during the pre-experimental period performed more frequently when the reinforcement was social than the group receiving non-social feedback. Deprivation or satiation did not produce any differential change in the subjects' performance when a non-social reinforcement followed the subjects' behavior. From the results of this study one can conclude that at least in this instance young children were more sensitive to direct social reinforcement than they were to impersonal abstract reinforcers.

Walters and Ray (1960) criticized the approach Gerwitz and Baer used to explain the results of their 1958 study. Walters and Ray note that Gerwitz and Baer have carefully analyzed the possible effects of schedules of reinforcement of the socially deprived. To assume however, they argued, that isolation activates a social drive in no way advances the analysis. In contrast, they offered the concept of anxiety (in the sense of an emotional response to stimuli associated with discomfort or pain) to explain differences in children in their initial responses to separation. However, the difficulty with this approach is that one must consider the subject's history of separation and what possibly may have occurred during these periods to substantiate the analysis.

The authors studied forty grade school children. The children were separated to form four experimental groups. Each group was exposed to one of four experimental conditions: (1) isolation with anxiety, (2) isolation without anxiety, (3) satiation with anxiety, and (4) satiation without anxiety. Using the Gerwitz and Baer (1958) marble game the authors found that anxious subjects conditioned more readily than non-anxious, and that there was a smaller difference between the isolated and the non-isolated. Thus there appears to be some empirical support for their contention of the anxiety explanation, although operationally defining anxiety may pose problems if the explanation was to be extended to non-laboratory situation.

Richard Brown (1971) studied possible interaction effects of social and tangible reinforcement on the bar press performance of young normal children. Previous studies concerned with either tangible or social rewards were cited. The author stated that the rationale for using a tangible reward system as part of a treatment program with children is that the occurrence of desired responses can be increased more quickly and maintained at higher rates than under contingent social approval alone. However, the author noted that it is often the case that tangible rewards are often accompanied by social praise, and in these situations the tangible rewards may have value both as tangible rewards and as tokens of social approval. As a result they may be more potent than either tangible rewards or social approval alone. This possible interaction effect was tested with sixty kindergarten children. Subjects were required to operate a telegraph key under conditions of tangible, social, or alternated tangible and social reinforcement. The reinforcement period was followed by a period of key presentation without reinforce-

ment. Sex of subjects and density of reinforcement were also included as variables. During the reinforcement period the bar press rate increased most under the condition of tangible reinforcement where it was alternated with social reinforcement. The girls also increased more than the boys. In the consequent non-reinforcement period the rate of the group with the history of only tangible reinforcement dropped below the rates of the other two groups.

In discussing the obtained results of the study, as related to the previously mentioned dual role of tangible rewards, Brown cited reference to research conducted by Kuypers, Becker and O'Leary (1968). In this study, employing a token system in a classroom resulted in minimal effects as contrasted to quite dramatic effects reported by O'Leary and Becker (1967). Kuypers et al. (1968) discussed the major differences between the two programs; the teachers in the successful program had extensive training in the application of behavioral principles emphasizing the use of contingent social reinforcement, while the teachers in the minimally effective program had no such training. This suggested that in the application of tangible reinforcement systems the social component may be a crucial factor.

Stevenson (1961) studied the effects of social reinforcement on the behavior of young children as a function of chronological age, sex of the experimenter and sex of the subject. Children between the ages of three and ten played a game of dropping coloured marbles through holes in a flat surface. Following a period in which the experimenters observed the performance of each child (i.e. obtained a base-rate), without attempting to influence it, male and female experimenters reinforced the children's performance verbally. The frequency of dropping marbles into the holes was the dependent vari-

able of the study. Results indicated that reinforcement by females enhanced the performance of both three and four year old boys and girls. At six and seven years, however, the experimenters were most effective when reinforcing a child of the opposite sex. The authors suggested a possible explanation for the obtained results based on social learning terms. As a function of our socialization process, specifically the development of male and female roles in young children of early school years, children are more or less deprived of contact with members of the opposite sex, at least to the degree of their previous relationships with them. Because of this deprivation, the effectiveness of women as reinforcing agents for boys and of men as reinforcing agents for girls is assumed to increase. This suggestion appears to be consistent with the findings of this study and of the previously mentioned study of Gerwitz and Baer (1958a).

The studies presented to this point have dealt with the study of social behavior and of social reinforcement effects on behavior with "normal" young children. It is quite obvious that social reinforcement and social behavior can be studied empirically and objectively without reference to internal mediating processes. It has also been demonstrated that certain variables related to the above phenomena (e.g. deprivation and/or satiation) incur the same laws of functionality in relation to reinforcement effects as any other behavior or reinforcement variable.

Analyses of Social Behavior and the Mentally Retarded

Research interest in social behavior and/or the effects of social reinforcement on behavior has also extended into the realm of mental retardation (Ross, 1969; Mitchell and Smereglio, 1970). Studies have compared mentally retarded and "normal" children (Stevenson and

Cruse, 1961), institutionalized and non-institutionalized retardates (Kaufman, 1967); and mentally retarded in differing institutions (Butterfield and Zigler, 1965; Klaber, Butterfield, and Gould, 1969).

It is quite obvious that many of the residents in mental institutions are lacking in many behavioral skills that "normal", non-institutionalized people have in their repetoires. This may be a function of mental retardation per se, but there may also be a restrictive influence of institutionalization that impedes the development of many of these behaviors in the mentally retarded, including the development of many social behaviors.

Kaufman (1967) studied the effects of institutionalization on three behavioral categories, one of which was social behavior. He compared the competence of institutionalized subjects re these behavioral categories with children in a home environment awaiting admission to the institution. He found that institutionalized subjects were lacking in many of the behavioral skills, including those related to social behavior, more so than the subjects studied in the home environment.

Given the probability that many institutionalized retardates have a deficit in their social behavior repetoires, a number of researchers have attempted to develop, or at least demonstrate the potential development of, social behavior in the mentally retarded.

Mitchell and Smereglio (1970) utilized two groups of twenty-five severely and moderately retarded institutionalized children. The children were evaluated for social competence development during their first years of institutionalization. This dependant variable, as determined by a Vineland Social Maturity Scale both before and after admission, was evaluated in relation to the therapy programs the subjects were involved

in. One group of children received "routine" care, characteristic of state institutions. The other group received "activity therapy", a high saturation teaching program in areas of constructive play, pre-kindergarten readiness, eating, and other self-care skills. Post-admission scores were obtained approximately three years after admission to the institution. The results of the study indicate that the subjects who received routine care made no progress in the Vineland social age. In fact they showed a significant decline of ten points in their average social quotient. The authors also reported that the children receiving activity therapy increased their social age, and although their social quotients did not increase, they did not drop below their pre-admission levels. However, these are group results, and must be considered in that context. The authors noted that the spread of scores in the post-admission test was greater for the activity group than the pre-admission scores. This suggests that the activity therapy may have had a more positive effect upon children who were initially higher functioning. Upon evaluating this possibility, it was found that children who were initially low in social competence showed a marked tendency to decline still further during their first three years of institutionalization regardless of the type of therapy program they received. The authors failed to include the number of severely and moderately retarded subjects who fell into this classification.

There is an additional problem in making any conclusive remarks about social ability utilizing test scores as in this study. To say that a child has increased his social quotient, as determined by an hour or two of testing procedures, does not necessarily mean that the child has increased his level or frequency of social behavior. Since

no data was offered as to the extent of the possible social interactions of the respective subjects with their peers or with the staff on the ward situation, one cannot conclude that the social ability of the subjects remained the same in the activity therapy as compared to the declining routine care group.

Paloutzian et al. (1971) controlled for this problem of interpretation by dealing with social interaction per se. Using a control group procedure the authors evaluated the relative effectiveness of a training program to promote positive social interaction in severely retarded young children. Prompting and reinforcement were used to train severely retarded young institutionalized children to imitate novel social responses of a model as a means of facilitating positive social interaction with peers. The experimental subjects were given a two part imitation training program. They first learned to imitate the the motor responses of an adult model and then participated both as subjects and as models for imitative motor responses involving social interactions with their peers. Matched pairs of subjects, ten experimental and ten control, were rated on the level of social behavior emitted on the ward setting both before and after the experimental subjects were trained. After training the experimental subjects exhibited a significantly higher level of social behavior, which, according to the authors, generalized to the ward setting. The control group showed no change in their level of social behavior. The major finding in this study was that it was possible to develop positive social behaviors in severely retarded young children so that they could be subsequently reinforced. The authors mentioned that they attempted to maintain positive behaviors resulting from training by having ward staff deliver positive social

reinforcement for appropriate responses emitted by the subjects in the ward situation. However, they made no comment as to the success or failure of this procedure. It may be noted, for future reference, that during training, correct responses by the subjects were reinforced with ice-cream and social approval by the adult experimenters.

Ross (1969), working with educable mentally retarded children, suggested that one probable reason why educable retardates do not emit social behavior, i.e. emit anti-social behavior, is simply that they do not know appropriate social responses and do not conform to norms of social behavior because they do not know what these norms are. This explanation disregards such intervening processes as "sense of failure" or "lack of values" etc. The latter explanations are vague and misleading, still requiring causal explanations of their origin.

Using an experimental and control group paradigm, Ross incorporated a two month training program to increase awareness of appropriate social responses in the experimental subjects. The experimental group learned verbal social responses, using doll play, live models, film slides and puppets. The control group was exposed to identical media but different content. From pretest and post-test scores compiled by a series of social behavior tests, the authors stated that the experimental group improved more in making appropriate social (verbal) responses than the control group, and even scored better than a second control group of "normal" children. However, whether this training had any effect on the behavior of the subjects in the natural environment was not mentioned, and therefore is open to speculation. The authors failed to comment on another aspect of the results of the experiment. Both the experimental and control groups increased their scores from pre-test to post-test; ($\bar{X}_1$ (mean score) = 9.25 to $\bar{X}_2$ = 32.13: $\bar{X}_1$ = 7.81 to $\bar{X}_2$ = 12.69,

respectively). Although there is obviously a significant difference in these increases, there is also an increase for the experimental group in the standard deviation of the scores; from 6.17 to 13.99. Standard deviation scores for the control group increased from 7.33 to 8.71. The training did not work for all the subjects involved, but no mention is made as to what type or classification the training was effective on.

From the for-mentioned studies of Ross (1969), Mitchel et al. (1970), Kaufman (1967) and Paloutzian et al. (1971), one can only reach a tentative conclusion. It does seem likely that social behavior, topographically speaking, can be shaped or developed in the severely retarded. However, successful generalization of this behavior to the ward situation is still open to question, requiring more research.

Social Reinforcement and the Mentally Retarded

A number of studies have evaluated the responsiveness of institutionalized retardates to social reinforcement. The first series of studies to be presented typically compare the performance of an institutionalized retardate with non-institutionalized normal and/or feeble-minded children. The rationale underlying these comparisons is that institutionalized retardates should have an experience of social deprivation similar to that as proposed by Gerwitz and Baer (1958). This deprivation is more specific for adult social attention. Hence, it is assumed that the institutionalized retardate will respond more for adult social approval than the non-institutionalized normal or feeble-minded child.

Stevenson and Cruse (1961) evaluated the effectiveness of social reinforcement with both normal and feeble-minded children. The authors were concerned with the effectiveness of social reinforcement over a

five day period as a function of three conditions; (1) a reward condition, in which the experimenter verbally reinforced the subject; (2) a neutral condition, in which the experimenter was present, but made no comments to the subject; and (3) a condition in which the experimenter was not present. These three conditions allowed the authors to evaluate the influence of the comments made by the experimenter, and also the influence of the presence of the experimenter. Ten normal children ($\overline{X}$ CA 5.2) and ten institutionalized children ($\overline{X}$ CA 14.2; $\overline{X}$ MA 6.1) were assigned to each condition. Using a marble task as the dependant variable, the authors found no difference between experimental conditions, although the feeble-minded subjects played longer than the normal subjects.

In a second study, a fourth condition was added; the experimenter giving negative comments for responses made by the subjects. It was assumed that these comments would suppress the performance of the feeble-minded more than for the normal subjects.

The results of the study verified this prediction as a significant difference in performance was obtained for the different subjects and a significant interaction was found between the type of subject and experimental condition.

Stevenson and Fahel (1961) obtained similar results to the first part of the Stevenson and Cruse (1961) study. They compared the effect of social reinforcement on the performance of institutionalized and non-institutionalized normal and feeble-minded children. The subjects played a marble game involving either one response, or six alternative responses. One half the subjects in each classification were assigned to one of the two games. One half the subjects played the game in

either a neutral condition (the experimenter was present but made no comments) or a reward condition (the experimenter made supportive comments every five minutes). No significant effects were found between type of subject, type of game and reward condition, although significant differences were obtained in response increment over base rate as a function of institutionalization. Higher response rates were obtained from the institutionalized subjects when the experimenter was not responsive while the opposite effect was obtained for the non-institutionalized subjects.

Stevenson and Hill (1965) noted that studies in which the subjects were involved in one of two conditions; (1) experimenter present and rewarding; and (2) experimenter present but making no comments, assumed that this strategy would give an indication of the effects of social reinforcement independent of such factors as the experimenter's presence, practise, fatigue, etc., which operate on the social reinforcement task. However, they suggested that failure to reward may have had some effect upon the subjects' performance in the supposed neutral condition. The authors were referring to the anxiety level of the subjects involved in the neutral condition. That is, no reward may have been an indication of failure to the subjects, even though they had not been previously exposed to the reward condition. In order to evaluate this possibility, the authors studied conditions as related to levels of anxiety. A state of anxiety was operationally established as failure at a simple task. The authors compared the performance of children on a criterion measure who had previously failed on a simple task with children who were successful. Ninety-six normal children, forty-eight in each group, played a marble game. A sixty second base-rate

of performance was obtained followed by six minutes of experimental phase during which one half the subjects in each group received either reward or non-reward for their performance. The subjects who were successful on the pre-criterion task performed at a higher rate when the adult made supportive comments than when the adult made no comments.

Failure subjects who received social reinforcement performed at a lower level than those who didn't. Therefore, it seems likely that the anxiety level of a given subject in a social reinforcement situation may have been important in determining the effects of social reinforcement on a simple task.

Harter and Zigler (1968) suggested that many of the behaviors of the institutionalized retardate are more related to pre-institutional histories of retardates who became institutionalized than to mental retardation per se. Behavioral differences between institutional and non-institutional retardates would appear to reflect differences in the motivation to interact with strange adults. The social deprivation experienced by the institutionalized retardate results in his being more highly motivated with an attentive and supportive adult than the non-institutionalized retardate. This motivational hypothesis assumes that the institutionalized retardate has been deprived of adult social reinforcement and is therefore highly motivated to obtain this particular class of social reinforcers. Thus one would expect the institutionalized retardate to be influenced more by social reinforcers dispensed by an adult than by a peer. The authors examined this hypothesis using a simple repetitive monotonous marble dropping task. Using either an adult or a peer as the dispenser of social reinforcement for the subjects, the authors found adult social reinforcement to be more effective

in influencing behavior with institutionalized retardates than for non-institutionalized retardates. This finding was consistent with those of Green and Zigler (1962) and Stevenson and Fahel (1961). The authors concluded that performance of institutionalized retardates (for social reinforcement) was relatively specific to attention and praise dispensed by an adult, rather than a more generalized desire for reinforcement dispensed by any social agent; a peer for example.

Harter and Zigler (1968) stated that the differential effectiveness of peer and adult social reinforcement is at odds with a popular view that retardates are inherently rigid and therefore preseverate on a dull monotonous task. Rather, how preseverative the retarded child is would appear to depend on the valence of the social reinforcer dispensed during the task. The relative ineffectiveness of peer reinforcement for the institutional subjects was not surprising, according to the authors, in light of the general availability of this type of reinforcer in the institutional setting.

The study also reported that peers were more effective social reinforcers than adults for non-institutionalized retardates. The conclusion presented was that such subjects were relatively satiated on adult contact.

Terrel and Stevenson (1965) studied the effectiveness of normal and retarded peers as reinforcing agents. Two studies were reported; the first dealt with the performance of normal and retarded boys from grades one to three and the second dealt with the performance of normal and retarded boys and girls from grades four to six. The children served first as subjects and then as reinforcing agents in a simple marble dropping task. The results of the first study were essentially negative.

However, in the second study, the performance of subjects reinforced by normal children was significantly above that of subjects reinforced by retarded children. A significant type of subject by reinforcing agent interaction indicated that the level of performance of normal children was higher when the reinforcing agent was a normal child, but that the performance of retarded children did not differ greatly as a function of the type of reinforcing agent employed. A significant sex of subject by type of reinforcing agent interaction indicated that the performance of the girls was affected to a greater degree than was the performance of the boys by the type of reinforcing agent applied.

Although not discussed by the authors, some data, presented as occassional data, may have accounted for the obtained results. Behavioral observations of verbalizations were presented in such a manner that upon first reading indicated that excessive verbalizations were made by the retarded subjects in the study receiving social reinforcement from the peer. However, the data may well include excessive verbalizations made on the part of the retarded reinforcing agent(s): "retarded subjects made significantly more verbal responses other than those they were directed to make".

The authors suggested that the differences in effectiveness appear to be due to the greater value that children placed upon supportive statements when they were made by a normal child than when they were made by someone acknowledged to be of sub-normal intelligence. However, if it was the case that the retarded reinforcing agent made excessive verbalizations during the sessions, then this factor may have had a distracting influence on the performance of the normal subject-retarded reinforcer group, compared to the normal subject-normal reinforcer group.

Minimal differences obtained on the part of the retarded subjects may have been the result of the same phenomena; the retardates verbalizing to both the retarded and normal reinforcing agents, the retarded reinforcing agent reciprocating verbalizations.

Butterfield and Zigler and Zigler (1965) cautioned against the comparison of institutionalized and non-institutionalized retarded subjects. Studies using this approach assume that since behavioral differences between these two populations (retarded children living at home and institutionalized retardates) are related to institutionalization rather than to intelligence, institutionalization represents a homogeneous psychological variable. That such a view is wide spread is indicated by the generally accepted practise of equating institutionalization with social deprivation. However, in order to treat institutionalization as a homogeneous variable, one must assume that certain critical social interactions are constant from institution to institution.

Klaber, Butterfield and Gould (1969) compared the responsiveness to social reinforcement of retardates in two different institutions. They noted that one major problem in comparing institutionalized and non-institutionalized children is that there is much doubt about the comparability of their early life experiences and their "institutional endowments". Their assumption underlying the comparison of subjects between institutions was that different groups of institutionalized children are more comparable on all variables except the character of their institutional experiences than institutionalized and non-institutionalized children. In addition, one advantage of inter-institutional comparisons is the recognition that institutions do differ. As a

result of this recognition there may be a reduction if incorrectly generalizing from one institution to another.

Klaber et al's. (1969) study involved a comparison of retarded subjects from one institution, Institution A with retarded subjects who had been transferred from Institution A to another institution, Institution B.

Institution A was classified as a more socially depriving institution, the good patient being the quiet patient. Resident demands on the staff were discouraged, noisy and aggressive children swiftly punished. Staff interaction with the patients was minimal. Institution B was a small demonstration facility in which interaction with the residents by the staff was encouraged, the children being involved in a variety of activities with the staff throughout the day.

The task involved a two-part form board game in which the subjects were required to place felt figures on the board. An adult reinforcer sat at one end of the board, the subject at the other end. During the first part of the study, the dependant variable was the distance the subjects placed the form from the adult reinforcer. The first part of the study entailed twelve trials on the part of the subjects. In the second part of the study the duration of experimental play with the forms was the dependant variable. Social reinforcement was presented on every other trial, the subjects being reinforced for their choice of forms. No comment was made about the sex distribution of the subjects, although it stated that the subjects were closely matched.

The results reported indicated that the children who remained in the more depriving institution approached closer, and elected to

stay longer with the socially reinforcing adult than those subjects who were transferred to Institution B.

The authors stated however, that the results of the study did not establish whether the effects of residing in a depriving institution were reversible. Since the children were only examined once, it was impossible to determine whether the transferred children decreased or whether the non-transferred children increased in responsiveness to social reinforcement.

Butterfield and Zigler (1965) also studied the effects of differing institutional climates on the effectiveness of social reinforcement on the mentally retarded. Subjects were chosen from two residential schools for the mentally retarded having the same admission policies. The two schools differed, however, in their orientation towards residential treatment. One institution, Institution A, had a "home-like" environment, catered to the children in small groups and placed an emphasis on personal responsibility rather than on external control. The other institution, Institution B was typically custodial, dealt with large groups and placed emphasis on external control.

Two studies were conducted with subjects from the two institutions. The first study involved two groups of ten children from each institution, matched on mental age (MA), chronological age (CA) and length of stay. The task involved in the study was a marble game. Subjects were divided into one of two groups: (1) Group I received verbal support from an adult experimenter for their performance on the task; (2) Group II received no verbal comments from the experimenter although the experimenter was present. The results of this study were similar to those of the first study of Stevenson and Cruse (1961): no

significant effects were found as a result of experimental manipulation, although subjects from Institution B played longer than subjects from Institution A. The authors concluded that the game measure, used in many social reinforcement studies was sensitive for gross differences in the need for social reinforcement, regardless of the type of social reinforcement being dispensed.

The second study involved four groups, each group consisting of twenty subjects. Two groups of subjects were selected from each institution. There were two experimenters involved in the second study. Each experimenter participated with one group from each institution, giving verbal support for the subject's performance on the task. The task under consideration was the marble game used in the first study. The results indicated that subjects from Institution B played longer than subjects from Institution A. There was also an experimenter by institution interaction. That is, different experimenters were differentially reinforcing for different populations.

According to the authors, the findings of this study clearly indicated that differing social climates resulted in differing performances on a simple motor task. The results obtained with this task in other studies suggested these differences in performance reflected differences for social reinforcement. Such a conclusion may be consistent with the view that the more social deprivation experienced by the child the greater will be his motivation for social interaction and support. However, it is far from clear what specific aspects of the social-psychological environment produced the differences obtained in the studies.

Literature in this area, which has grown considerable in recent years is becoming replete with inconsistent findings. For example,

Stevenson and Cruse (1961) and Farrel and Stevenson (1965) and Butterfield and Zigler (1965) did not obtain significant social reinforcement effects in the first part of their respective studies. However, significant results were reported as a result of subsequent manipulations. However, as noted by Butterfield and Zigler (1965) since much of the research is done with institutionalized retardates, it is possible that many of these inconcistencies are the results of differing experimenters working with retardates drawn from differing social climates.

One question may be raised about studies evaluating the effectiveness of social reinforcement on behavior, particularly studies involving comparisons of differing reinforcing agents, for e.g. between adults and peers. By definition, a verbal stimulus, presented after a response may be considered reinforcement <u>if</u> the behavior it follows is increased or maintained in frequency above a free operant level. If the behavior does not increase above the free operant level, or is not maintained above the free operant level, then that verbal stimulus is merely that a verbal stimulus and not a social reinforcer. Unfortunately, many studies imply that the presentation of a verbal stimulus by either a peer or adult was reinforcing, and evaluation was made of the differential reinforcing effects, without consideration of how the subject would have responded in a free operant situation.

Other studies have used a sixty second to four minute baseline period to determine response rates of the subject and to compare the presentation of verbal stimuli following responses during the "experimental phases". However, this strategy poses another problem; one does not know whether or not the free operant response rate would increase as a function of time, thus detracting from any experimental effects.

A good strategy, therefore in studying the effects of verbal stimuli presented after a behavior would be to have a record of the free operant behavior the subjects would emit over an extended period of time or as close to the reinforcement period as possible.

The studies presented to date, although subject to some design and interpretation criticisms, have attempted to evaluate social behavior and/or social reinforcement with both normal and retarded children, and as such are relevant to the following research conducted primarily with severely retarded subjects.

CHAPTER III

STATEMENT OF THE PROBLEM

The purpose of Phase I of the study was to evaluate the relative effects of adult and peer praise on the lever pressing behavior of institutionalized retarded females during ten minute sessions conducted three times a week. This evaluation involved the comparison of the performance of the subject(s) for both adult and peer praise sessions with the performance of the subject(s) during free operant sessions conducted on each experimental day.

The purpose of Phase II of this study was to determine if pairing the presence of the retarded peer with the verbal praise of the reinforcing adult would enhance performance for peer praise, compared to the performance of the subjects during the free operant sessions. This was done for one subject who had previously demonstrated adult praise to be reinforcing.

The purpose of Phase III of this study was to evaluate the relative effects of response contingent candy on the performance of the subjects, in addition to response contingent adult and peer praise. Phase III also involved a pairing of peer praise with candy presentation to determine if the pairing would enhance the performance of the subjects for peer praise alone compared to the free operant level of the subjects' performance. In addition, manipulations were made to evaluate possible differential reinforcement effects of differing adult experimenters on the performance of two subjects for adult praise.

The purpose of an additional experimental probe was to evaluate the effectiveness of adult and peer praise on a behavior emitted as a

result of verbal prompting cues for lever pressing presented during experimental sessions.

CHAPTER IV

METHOD

A. Subjects

Four severely retarded females, and one moderately retarded female, all residents of the Manitoba Training School for Retardates participated in the study. Four of the females served as subjects, one female served as the peer reinforcer. Table 1 presents a summary of the institutional records of the respective residents. The subjects chosen for study were selected from a pool of eight girls who were available for research purposes. All the girls were residents of the same cottage unit in the institution. Participation in the study was dependant upon the emission of a criterion performance during baseline sessions.

One severely retarded girl was selected and trained to act as the peer reinforcing agent. The peer was trained to emit the phrase "good girl" to the stimulus cue of an illuminated green light, until she emitted the phrase, without error, for a ten minute period. During this training, non-experimental subjects sat in a chair facing the peer.

A female university graduate student was selected to serve as the adult reinforcing agent. The female adult had successfully attained a Bachelor of Arts degree at the University of Manitoba with a major in psychology. In addition, the female adult had participated in an on-going operant conditioning program at the Manitoba School as partial requirement in the completion of an undergraduate psychology course. The female adult was instructed to emit the phrase "good girl" whenever

TABLE 1

A Summary of the Institutional History of Retarded Females Participating in Study

Subject	Chronological Age	Diagnosis	Social Age	Social Quotient	Mental Age	IQ	Yrs. in Institution
S1	23 yrs.	Encephalopathy	5 yrs. 2 mo.	--	2 yrs.	20	16 yrs.
S2	17 yrs.	Encephalopathy	--	.65	4 yrs. 6 mo.	33	10 yrs.
S3	26 yrs.	Arachnoductylism	5 yrs. 6 mo.	.24	--	40	18 yrs.
S4	23 yrs.	Achondroplastic Dwarfism	--	.31	2 yrs. 5 mo.	25	7 yrs.
Peer Reinforcer	19 yrs.	Encephalopathy Hydrocephalis (secondary)	5 yrs. 10 mo.	--	3 yrs. 7 mo.	25	11 yrs.

the green stimulus light was illuminated and was to make no other verbal comments to the subjects.

B. Apparatus

The task selected for study was pressing a telegraph key. Previous research (Brown, 1971) suggested that key pressing is a very simple motor response that is not physically incompatible with looking at the reinforcing stimulus, and in most cases allows stable response rates to be quickly obtained in response to instructions. The task itself is relatively boring and there is little about the task that might reinforce further responding.

The apparatus was situated on a table, the surface of which measured 4 feet by 2 feet. Two fibre-glass chairs were located on either side of the table, facing one another. A standard Armaco telegraph key (model T-ELK) was mounted in a wooden box, measuring 12 inches by 6 inches by 4 inches, was placed in the middle of the table. The lever key protruded 3 inches out of the box. Mounted on the back of the lever box, facing in the opposite direction from the lever, was a one quart aluminum can in which a twenty-five watt green light bulb had been assembled. An automatic candy dispenser was later to be situated on the table beside the key-box.

In addition, various electrical equipment was assembled to which the previously described apparatus was wired. These included a cumulative recorder, (paper speed of 20 inches per hour), a six-digit numerical print out counter, a variable interval timer, and a variable interval fifteen second timing tape. Standard Leigh-Hi Valley electro-mechanical panelled programing equipment was also used in the study.

C. Procedure

The apparatus was set up in an operant conditioning research room in one of the cottages of the institution. The table on which the lever apparatus and later the automatic candy dispenser were situated was placed in one corner of the session room. The electrical recording and programing equipment was set up in an adjacent observation room. The observation room allowed undetected observation of the session room, a one-way mirror separating the two rooms.

The programing equipment was wired such that all lever responses would be graphically presented on a cumulative recorder. In addition, a numerical print-out of responses was programed for each minute of session time. Each print-out was represented by a corresponding vertical slash of an event pen on the cumulative record.

The variable interval timer was programed such that a lever response following completion of the variable interval illuminated the green stimulus light on the lever apparatus for a five second period. These "reinforcement cues" were represented on the cumulative record by diagonal dashes on the cumulative line. The variable interval timing tape was programed with an average interval of fifteen seconds, the range of intervals being from five to thirty seconds.

Baseline

The author brought the potential female subjects individually from their resident cottage to the cottage in which the study was to be conducted. The resident was taken into the research session room and seated at the table upon which the lever apparatus was situated. The author then said, "See the lever?" while simultaneously pointing to the lever:

"See how you can press the lever?", simultaneously pressing the lever five times; "You can press the lever if you want". This was the initial cue presented by the author at the start of each session and was constant for the duration of the study. After presentation of the cue the author left the session room, and went into the adjacent observation room to watch the subject's performance and to monitor the electrical equipment. If the subject failed to press the lever during the first five minutes of the baseline sessions, the author re-entered the session room and re-presented the cue as previously described. Except for this interruption, each subject was left in the session room, undisturbed, for a period of ten minutes. After the session time had expired, the author entered the session room and told the subject she could return to her cottage while escorting her out of the room. No comments were made as to the subject's performance during the baseline sessions.

Two baseline sessions were conducted for each of the eight potential subjects. Of these, three girls failed to emit any lever responses. One girl, although emitting lever responses, broke the apparatus during both sessions by pounding on the key. She was eliminated from the subject pool because of her destructive behavior. The four remaining girls were considered suitable subjects for study as they did emit lever responses at a free operant level.

Experimental Phase I - Procedure and Results

To determine the relative effectiveness of adult and retarded peer social reinforcement all subjects were exposed to three different experimental conditions: (1) a free operant condition, (2) a peer social praise condition, and (3) an adult social praise condition. All experimental sessions were ten minutes in duration, and one session

in each condition was conducted on each experimental day for each subject. The order of the sessions, and the time of day of presentation was altered daily to control for fatigue, satiation, order effects, etc.

During the free operant sessions, the subject sat alone in the session room for ten minutes after the initial cue was presented by the author. No consequences were made contingent upon lever responses emitted by the subject.

During the peer and/or adult social praise conditions, the respective reinforcing agent sat across the table, facing the subject. When cued by the illumination of the green stimulus light, the reinforcing agent emitted the phrase "good girl". In effect, because the illumination of the stimulus immediately followed a lever response emitted by the subject, verbal praise was made contingent upon lever presses. All other behaviors emitted by the subjects were ignored by the reinforcing agent.

On each experimental day the author brought the subject and the peer to the research cottage. Conversation was kept to a minimum, although the experimenter did not interact with the subject in an unfriendly or aloof manner. The author escorted the subject, and the reinforcing agent when required, into the session room and told the subject to be seated behind the table, guiding her to her seat. When required, the peer or adult sat on the other side of the table, facing the subject. The author then presented the cue, as per baseline condition, and then left the room to monitor the session from the observation room. Prior to the initiation of the experimental sessions it was determined that if the subject did not emit any lever responses during the first five minutes of any session, the cue would be re-presented by the author as per baseline condition.

This stipulation was in effect for three experimental days, with the exception of an experimental probe conducted on subject four. (See Supplemental Procedure I, Page 58).

After the required session time had expired, the subject was instructed by the author to sit down in a desk adjacent to the table. This instruction was presented over an intercom system connecting the observation and session room. The subject sat alone in the session room for approximately two minutes during which time the author reset the programing equipment. The author then went into the session room, escorting the reinforcing agent when required, and asked the subject to sit behind the table. The lever pressing cue was then presented to the subject, after which the author left the room. This procedure was repeated for the three ten minute sessions conducted on each experimental day, after which the author escorted the subject back to her home cottage. No comments were made, at any time as to the performance of the subjects during the sessions.

The performance of the subjects on the lever pressing task was the dependant variable of the study. Phase I was initially proposed to run for six experimental days at which point analysis of the data was made.

Results

The summarized data for subjects S1, S2 and S3 is presented in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5 and Figure 6, and in Table 2 and Table 3, under the heading of Phase I. Data for subject S4 will be considered at a later point as this subject was involved in an experiment probe as a result of her performance characteristics.

The data was analyzed, for the most part, in reference to the

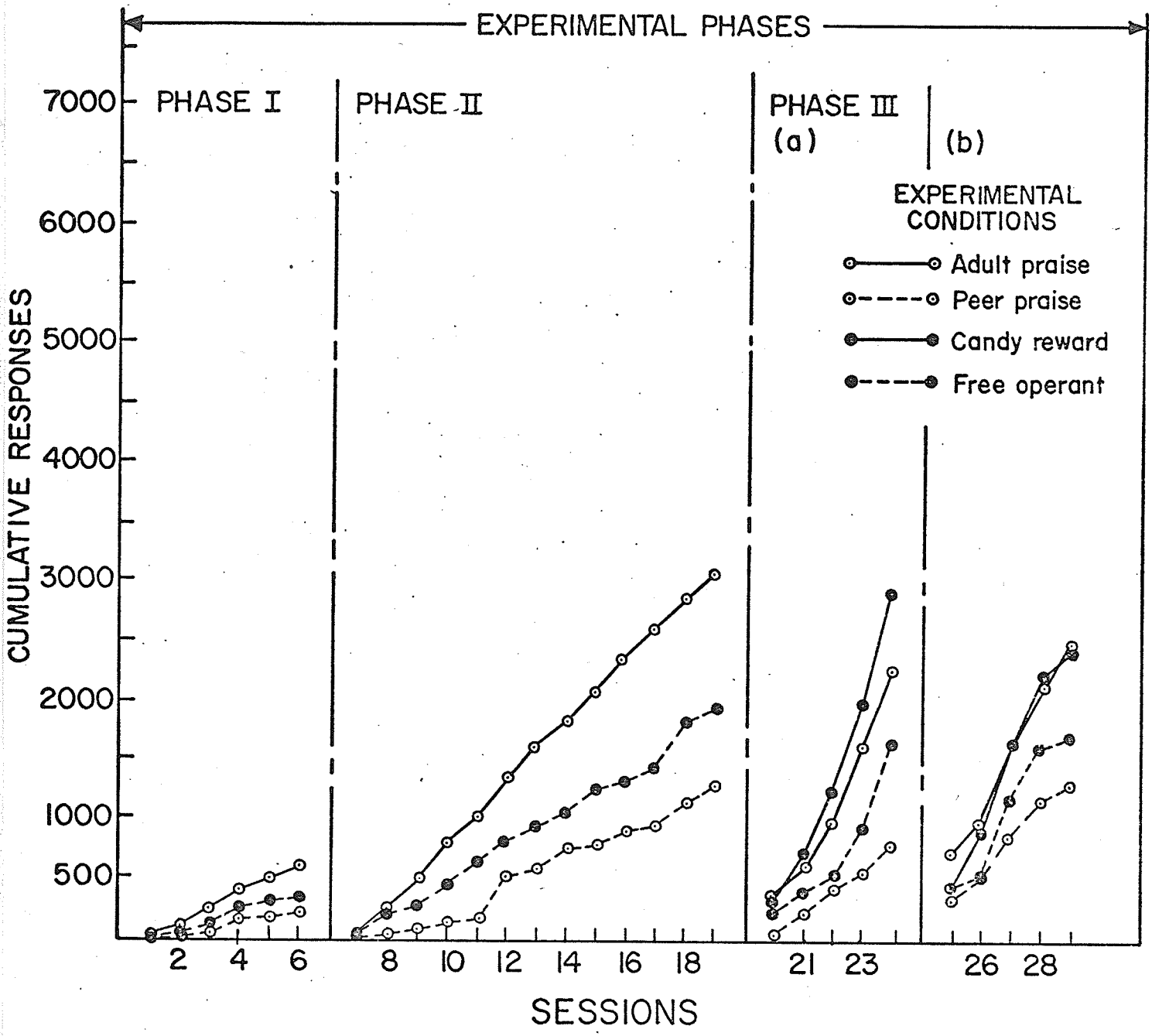

Figure 1. Cumulative Key-pressing Responses per Session of S1 in Experimental Conditions and Phases

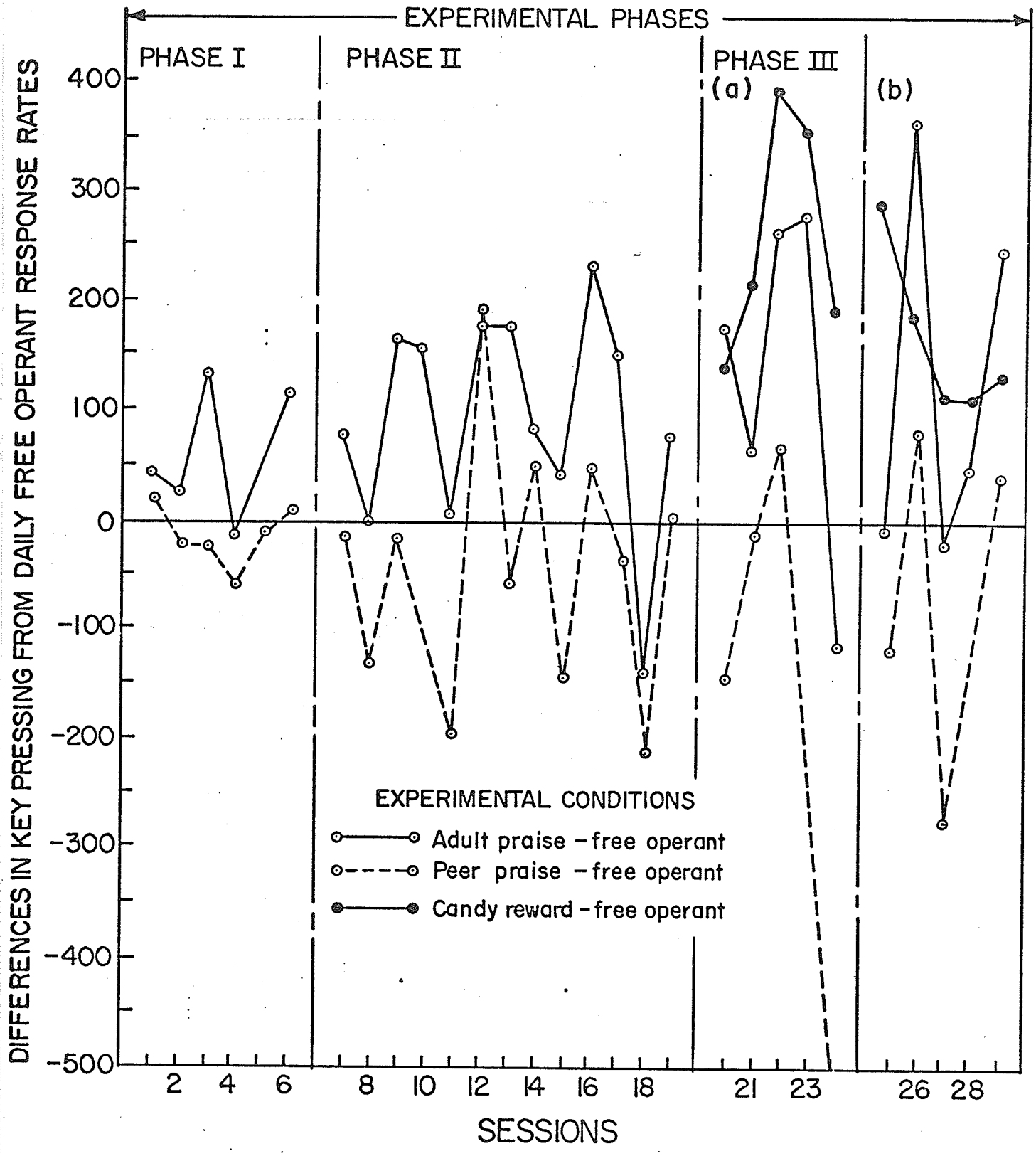

Figure 2. Comparison of Difference Scores of S1 Between Experimental Conditions and in Experimental Phases

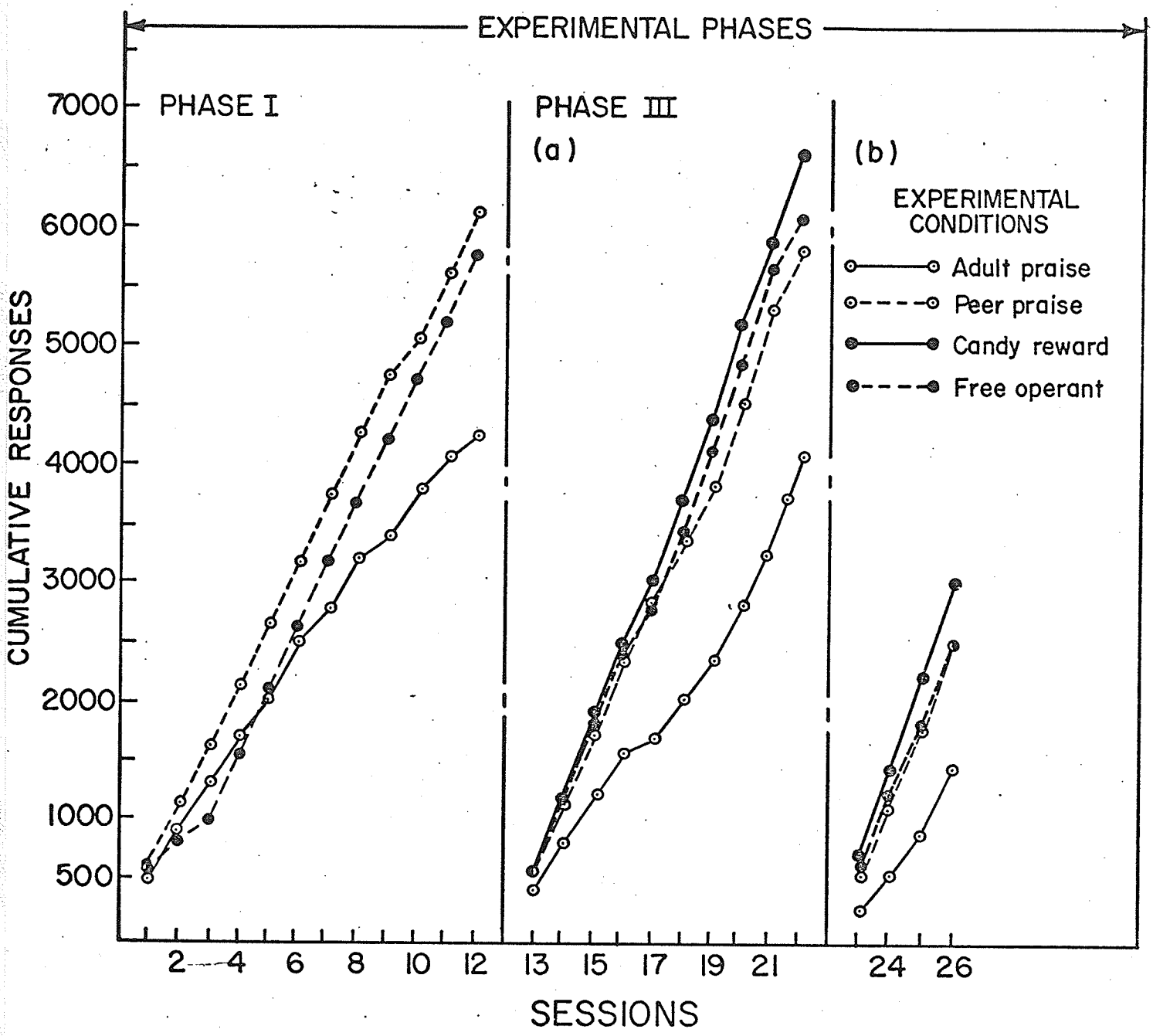

Figure 3. Cumulative Key-pressing Responses per Session of S2 in Experimental Conditions and Phases

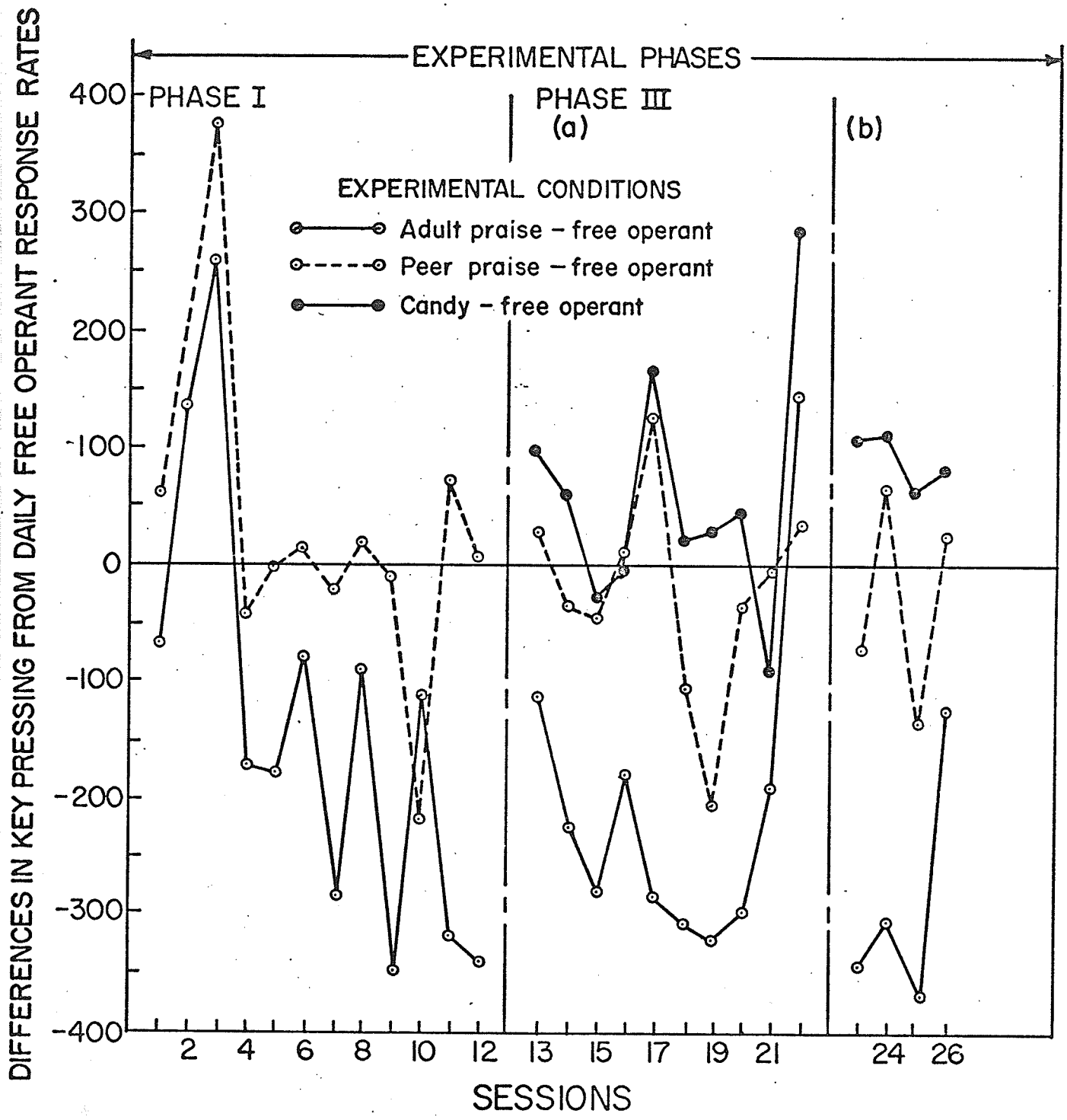

Figure 4. Comparison of Difference Scores of S2 Between Experimental Conditions and in Experimental Phases

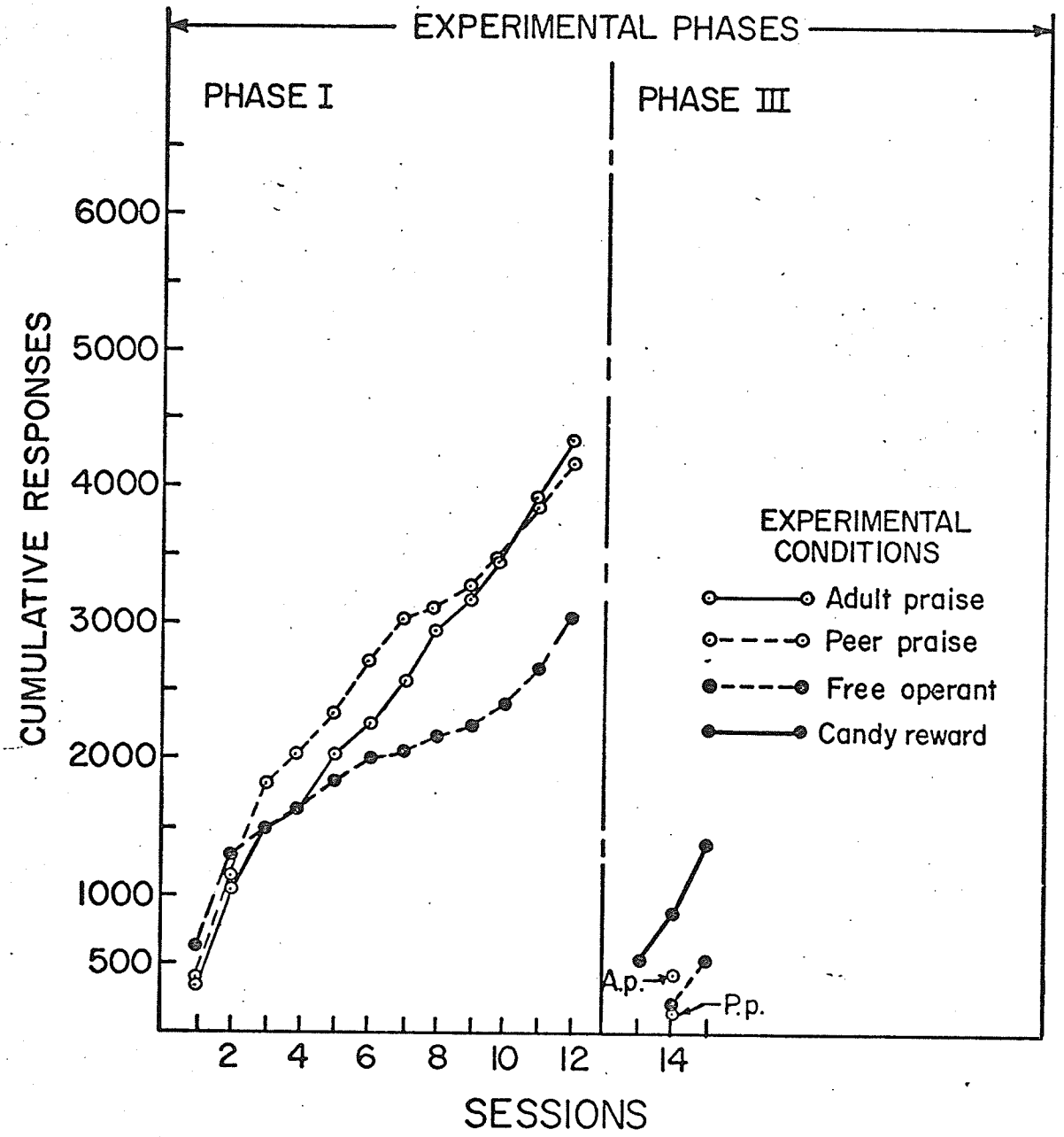

Figure 5. Cumulative Key-pressing Responses per Session of S3 in Experimental Conditions and Phases

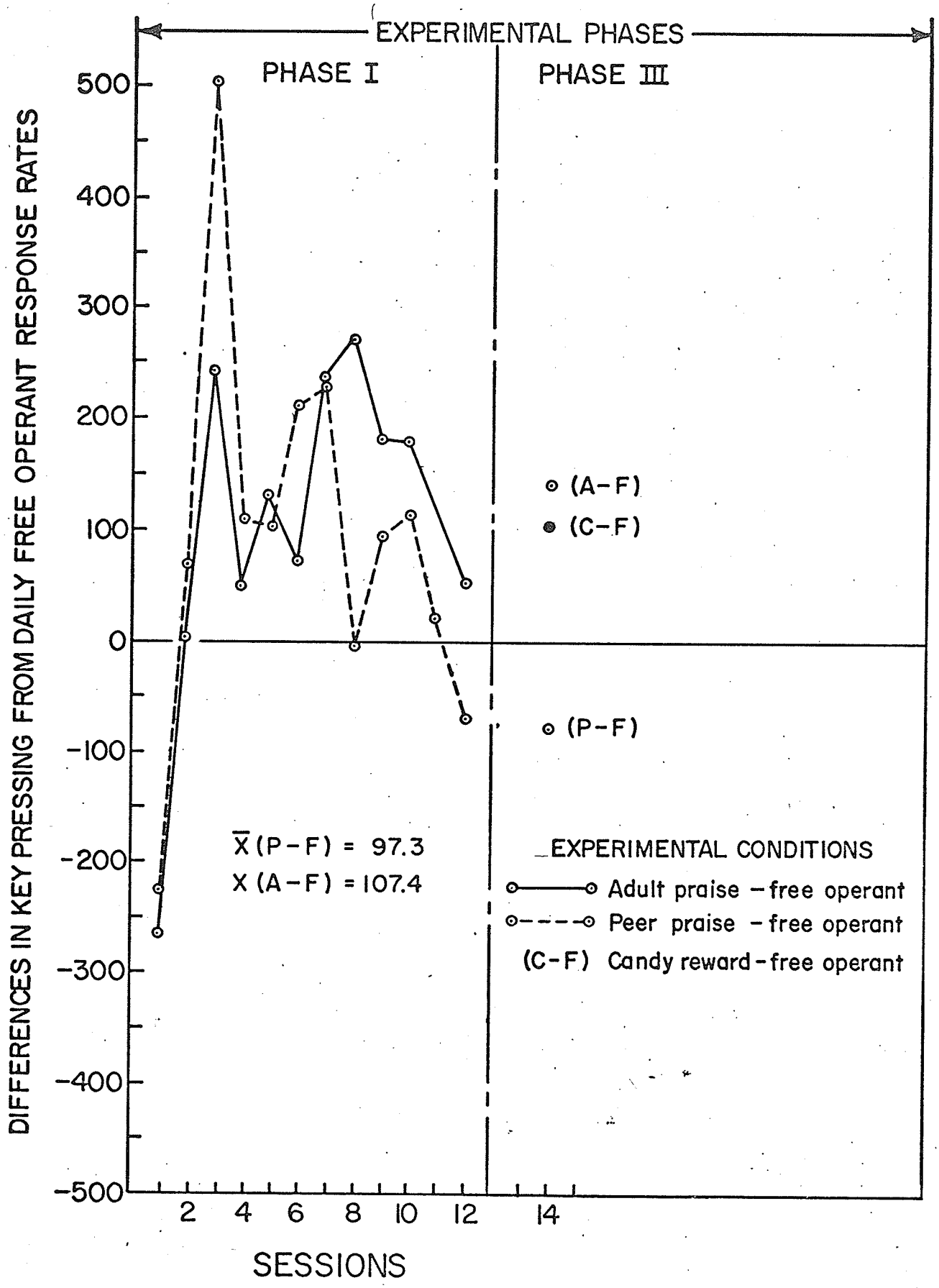

Figure 6. Comparison of Difference Scores of S3 Between Experimental Conditions and in Experimental Phases

TABLE 2

Average Response Rates of Subjects S1, S2 and S3
In Each Experimental Condition During the Experimental Phases

Subject	Experimental Phases	Free Operant Sessions	Peer Praise Sessions	Adult Praise Sessions	Candy Reward Sessions
S1	Phase I	58.2	43.5	114.2	--
	Phase II	150.4	104.8	241*	--
	Phase III a)	336.6	172	465.4	592
	Phase III b)	357.8	212.4	504.2	495.8**
S2	Phase I				
	Sess. 1-6	441.3	539.0	424.3	
	Sess. 7-12	526.2	498.5	294	
	Phase III a)	609.1	583.8	402.9	664.8
	Phase III b)	663.3	634	378	755.7**
S3	Phase I				
	Sess. 1-6	331.6	460.5	372.8	
	Sess. 7-12	178.6	244.6	352.5	
	Phase III a)	271	193	411	374

*Represents mean responses per session in which peer presence was paired with adult social praise.

**Represents mean responses per session in which peer praise was paired with candy reward.

TABLE 3

Mean Difference Scores of Subjects S1, S2 and S3
Comparing Response Rates During Adult and/or Peer Praise Sessions
With the Free Operant Response Rates During the Experimental Phases

Subject	Experimental Phase	Number of Sess.	Difference Score Derivations		
			$\bar{X}(P-F)^a$	$\bar{X}(A-F)^b$	$\bar{X}(C-F)^c$
S1	Phase I	6	- 15.0	55.3	--
	Phase II	13	- 45.5	89.6*	--
	Phase III a)	5	-164.6	128.8	256.2
	Phase III b)	5	- 83.4	148.4	140**
S2	Phase I				
	Sess. 1-6	6	97	- 17	--
	Sess. 7-12	6	- 27.6	-248.9	--
	Phase III a)	10	- 25.1	-204.2	55.7
	Phase III b)	4	- 29.5	-285.5	89.8**
S3	Phase I				
	Sess. 1-6	6	128.6	41	
	Sess. 7-12	6	66	172.3	
	Phase III a)	1	- 78	140	103

*Mean difference between average responses during free operant sessions and adult praise + peer present sessions.

**Mean difference between average responses during free operant sessions and candy reward paired with peer praise sessions.

[a] $\bar{X}(P-F)$ = Sum of daily difference scores between peer praise (P) and free operant sessions ÷ number of session days per phase.

[b] $\bar{X}(A-F)$ = Sum of daily difference scores between adult praise (A) and free operant (F) sessions ÷ number of sessions per phase.

[c] $\bar{X}(C-F)$ = Sum of daily difference scores between candy reward (C) and free operant (F) session ÷ number of session days per phase.

daily free operant performance of the subjects over experimental days. This strategy was undertaken because of the daily variability in response rates of the different subjects. Daily difference scores were obtained by subtracting the free operant responses emitted by a given subject from the response total in the adult and peer praise sessions respectively.

Only one subject, subject S1, responded more for adult social reinforcement than for peer social reinforcement (see Table 2). The performance of subject S1 was consistent with the findings of Harter and Zigler (1968), which found adult social reinforcement more effective than peer social reinformance on institutionalized retardates. From Figure 1 and Table 2 it was evident that the response rate of subject S1 for adult praise was almost twice that of the response rate during the free operant sessions during the six session days. In addition, overall responding for peer praise was slightly below the free operant level. Figure 1 revealed a steady rate of responding for adult praise over session days, while the response rates in the free operant and peer praise conditions decreased during the last two sessions. Figure 2 revealed that, with the exception of the first and last session in phase I, subject S1 responded below the free operant level for peer praise, while responding for adult praise was consistently above the free operant level with the exception of day four.

By definition, the adult was, indeed, reinforcing lever presses for subject S1 while peer praise was, in actuality, not only not reinforcing, but may have retarded responding below the free operant level.

Overall results of the first six session days revealed that subject S2 responded more for peer social praise than for adult social praise (see Table 2). The average response rate per session of subject S2

indicated that almost one hundred responses more per session were emitted for peer praise than during the free operant sessions. Responding for adult praise however was slightly below the free operant level. Figure 3 depicted a sharp increase in subject S2's response rate during the free operant sessions after session day three. Responding for adult praise did not show the same trend, decreasing slightly on day 4 and 5. As a result, subject S2 responded well below the daily free operant level during the last three session days of Phase I (see Figure 4).

By definition, the peer was reinforcing lever responses for subject S2, while adult social praise was not only not reinforcing, but may have retarded responding below the free operant level.

Subject S3, the moderately retarded subject, also responded more for peer praise than for adult praise during Phase I sessions (see Table 2 and Figure 5). However, it was also evident that both adult and peer praise resulted in overall response rates above the free operant level (see Table 2 and Table 3 and Figure 6). Figure 5 showed an overall decrease in the subject's response rates in all three experimental conditions over session days. However, it was evident that free operant responding decreased to a much greater extent than responding for either adult or peer social praise.

By definition, both adult and peer praise were reinforcing lever responses of subject S3 as both conditions resulted in higher response rates than the daily free operant level.

The results of the six experimental session days showed; (1) one subject responded more for adult praise than peer praise, adult praise sessions being above the free operant level, peer praise sessions being below the free operant level and, (2) two subjects

responded more for peer praise than for adult praise, adult praise resulting in a response rate below the free operant level for one subject.

As a result of the preceding analysis, it was determined that two of the subjects, S2 and S3, would continue with the Phase I conditions until an adequate stability in their performance could be obtained. As mentioned earlier, response rates for these subjects was declining in at least one of the experimental conditions.

The stability criterion selected for this phase of the study was related to the proportion of the total responses made on each experimental day in each of the three experimental conditions. A proportional stability criterion was selected over a response rate criterion because of the variability of the subject's response rates over days. The daily proportion of responses per condition was computed by dividing the number of responses emitted in a given condition by the total number of responses emitted on a given experimental day. Thus if on a given day the subject made 100 responses in each condition, the proportion of responses emitted in each condition would be (100 ÷ 300 =) .333. Stability in performance was arbitrarily considered obtained when the proportion of responses in each condition was within .05 on two consequetive session days for each condition. This stability criterion was selected as it was considered sufficient to include performance differences that may have been the result of fatigue, due to the differing order of session presentations across experimental days. Table 4 presents the proportion of responses made by subjects S2 and S3 during Phase I of the study.

Both subjects S2 and S3 remained in the Phase I condition for a

total of twelve sessions, at which point the stability criterion was obtained (see Table 4). During these additional experimental days, the response rate of subject S2 for adult praise continually stayed below the daily free operant level, deteriorating well below that of the first six sessions (see Figure 4 and Table 3). However, performance during the peer praise sessions also decreased over days, in relation to the free operant level. Indeed, performance for peer praise was below the daily free operant level on four of the six additional session days (see Figure 4). During this time, the overall response rate of the subject during the free operant session increased (see Table 2 and Figure 3).

During the additional session days, the performance of subject S3 also showed some interesting changes. The overall response rates in each condition declined from the level of the first six sessions, the free operant level dropping the most, then the peer rate and the adult rate dropping least (see Table 2). This phenomena is depicted in Figure 5 and Figure 6 and in Table 3. Figure 6 and Table 3 showed an increase in the difference score for adult praise above that for the peer praise. Thus, at the point where stability in performance was obtained, adult praise was slightly more effective than peer praise in maintaining responding above the free operant level.

Experimental Phase II - Procedure and Results

From the results of Phase I it was evident that adult social praise was reinforcing for subject S1, more so than peer praise, which resulted in a response rate below the daily free operant level. An attempt was made to determine whether the effectiveness of peer social reinforcement could be developed for this subject, by pairing the peer's presence with the reinforcing adult.

TABLE 4

Proportion of Total Daily Responses Emitted by Subjects S2 and S3 During the Additional Experimental Sessions in Phase 1

		Experimental Conditions		
Subject	Session Day	Free Operant	Peer Praise	Adult Praise
S2	6	.348	.356	.296
	7	.406	.390	.204
	8	.351	.362	.287
	9	.433	.422	.145
	10	.426	.253	.321
	11	.368	.419	.213
	12	.414	.42	.166
S3	6	.205	.492	.303
	7	.106	.445	.449
	8	.186	.189	.625
	9	.149	.328	.523
	10	.209	.354	.437
	11	.286	.305	.409
	12	.336	2.79	.385

Phase II of the study for subject S1 entailed three experimental conditions; (1) the peer social praise, (2) the free operant condition as per Phase II, and (3) an adult social reinforcement, peer present condition. The latter condition was the same as the adult social praise condition of Phase I except that the peer reinforcer was seated next to the adult during the adult praise session. No comments were made by the peer during the adult praise session. No comments were made by the peer during this third condition.

Phase II was in effect for thirteen experimental days, and the results are presented in Figure 1, Figure 2 and in Table 2 and Table 3.

Results

Figure 1 and Table 2 revealed an overall increase in responding by subject S1 in all experimental conditions compared to the response rates in Phase II. However, this increase, especially during the free operant sessions, may indicate a "learning-to-learn" effect. The fact that the relative increases in response rate between the free operant and peer condition were identical, supports a learning-to-learn contention. However, the effectiveness of adult praise, proven to be effective with this subject may have been confounded by the possible learning-to-learn effect and as a result the increase in this condition was well above the relative increase that would be expected. The fact that the relative increases in responding in the free operant and peer praise conditions were identical supports the contention that peer praise for this subject was not a reinforcer, as there was no confounding of the response rate as with the adult condition. However, by the same token, one cannot conclude that peer praise retards responding, for it seems plausible that if this were the case, the response rate increase would have been well below that presented in Table 2.

Difference scores (Table 3 and Figure 2) indicated an overall increase in responding to adult praise over the daily free operant level. The peer condition continued to yield response rates below the free operant level, even lower than in Phase I.

Thus, although a general increase in responding occurred in all experimental conditions, the relative effectiveness of peer social praise for subject S1 was not enhanced by pairing the peer's presence with adult social reinforcement. In light of the above findings, subject S1 was introduced to Phase III of the study.

Experimental Phase IIIa) -Procedure and Results

Phase III was incorporated for three of the four experimental subjects; S1, S2, and S3. Subjects S2 and S3 moved directly to Phase III from Phase I as no significant difference in performance was considered obtained for adult social praise above that of the peer praise.

Phase III involved a two step procedure; (a) the introduction of a fourth experimental condition (the presentation of candy reward for lever responses), and (b) the pairing of peer social praise with candy to evaluate whether this pairing would alter the influence of peer praise on the performance of the subjects.

An automatic candy dispenser, present in the corner of the session room during the previous phases, was placed on the table next to the lever apparatus. A removable cardboard partition was placed over the front of the candy dispenser prohibiting access to a shute into which the candy would fall. During the sessions in which candy reinforcement was made available to the subjects, the cardboard partition was removed, exposing the candy shute.

At the start of the sessions during which candy was to be presented

to a subject, the author brought the subject into the session room and showed her a variety of candies from which she could select. Candy selection was made from an assortment of marshmallow miniatures, potato chips, chocolate coated peanuts and raisins, smarties, mini-chips and jellybeans. After the subject had selected the candy she wanted, the author then proceeded to load the dispenser with that type of candy. The author then told the subject to sit behind the table and presented the cue as per baseline sessions. At the start of the first session during which candy was presented, the author presented the cue and manually presented a candy to show the subject how the candy would be delivered. During subsequent candy reward sessions throughout Phase III only the lever pressing cue was presented to the subjects at the start of the sessions. During the candy reinforcement sessions, the author manually operated the candy dispenser, allowing the candy to drop into the candy shute whenever the green stimulus light came on. This cue was visible to the author in the observation room.

Reinforcement by candy set the occasion for different behaviors on the part of the subject that completed with lever pressing. The subject could stop lever pressing, reach into the shute, pick up the candy and place it in her mouth or on the table. Because of this extraneous variable, the timing apparatus and recording equipment was stopped whenever the subject made a movement towards the candy after its presentation. The apparatus was turned on again after the subject had placed the candy in her mouth, or after five seconds had expired from the time the apparatus was turned off. If, at the completion of a candy reward session, the subject had not consumed all the candy presented, the unconsumed edibles were collected by the author and returned to the subject at the end

of the day's sessions.

Results

The summarized data of Phase III for subjects S1, S2 and S3, is presented in Figure 1, Figure 2, Figure 3, Figure 4, Figure 5 and Figure 6, and in Table 2 and Table 3 under the heading of Phase III a).

Table 1 revealed that the response rates of subject S1 was generally greater in experimental conditions during Phase III a) than the rates in the respective conditions during the preceding phases. However, the relative response increase during the peer praise sessions was less than the response increase observed during the free operant sessions. Responding during the free operant sessions more than doubled that emitted during the preceding phase.

Mean difference scores (see Table 3) for Phase III a) showed adult praise continuing to result in response rates above the free operant level. Candy reward, however, had an even greater effect than adult praise in influencing responding over the free operant level.

Similar results for candy reward were obtained from subject S2. Figure 3 and Figure 4, Table 2 and Table 3 demonstrated the reinforcing effect of candy during this phase of the study. Overall response rates of subject S2 also increased during this phase of the study. However, as presented in Table 3, neither adult nor peer praise was effective in raising the response rates in these respective conditions above the free operant response rates obtained in this segment of the study.

During Phase III a) subject S3, the moderately retarded subject, was dropped from the study because of the destructive behavior that developed during the experimental sessions. The subject was brought in for sessions on three experimental days, completing sessions for all

conditions on only one occasion, day 2 of Phase III a). On the other occasions, the subject's behavior was appropriate until the candy reinforcement session had terminated, at which point the subject started to emit a variety of "tantrum" behaviors. At the start of the session, following candy reinforcement, the subject physically abused the reinforcing agent who sat across from her and/or started to break up the equipment. This occurred after social praise followed lever pressing, and candy was not delivered. As a result of this behavior, the subject was released from further experimental duties.

The one experimental day's data for this subject shows peer praise to be below the free operant level, while candy and adult praise yielded response rates above the free operant level (see Table 2). The response rate for candy reward was below that for adult praise. However, this may have been due to the fact that the adult session immediately followed the candy session. The cumulative graph obtained for that session showed a rapid rate of responding at the start of the adult session (311 responses in the first five minutes) after which the response rate declined (100 responses in the last five minutes). In effect, an extinction curve was demonstrated upon the removal of candy reinforcement. However, lack of follow-up data precludes any further comments as to the relative effects of candy, adult or peer reinforcement with this subject.

Experimental Phase III b) - Procedure and Results

The results of the introduction of candy reinforcement for lever responses demonstrated that the candy was, indeed, reinforcing for subjects S1 and S2, more so than the other experimental conditions of adult and/or peer praise. An attempt was therefore made to determine

whether the influence of peer praise could be enhanced by pairing peer praise with the presentation of candy reinforcement for lever pressing.

During the candy reinforcement condition in Phase III b), the peer was seated across from the subject and upon each presentation of candy for lever responses emitted the phrase "good girl". The three other conditions, adult praise, peer praise and the free operant were also in effect during this final phase of the study.

Results

The results of Phase III b) are presented in Figure 1, Figure 2, Figure 3 and Figure 4, and in Table 1 and Table 2 under the heading Phase III b).

In general, the results led to the conclusion that pairing peer praise with the presentation of candy for lever responses resulted in only slight success in raising the response rates of the subjects involved during subsequent sessions when peer praise was presented alone. However, this increase was not sufficient to surpass the level of responding during the free operant sessions conducted during this condition.

Figure 1 and particularly Figure 2, and Table 1 and Table 2 shows that the pairing of peer praise with candy reinforcement resulted in a general decrease of responding for subject S1 during the pairing session, when compared to the subject's performance for candy alone in Phase III a). Mean response rates dropped by 96.2 responses in Phase III b), difference scores between candy presentation and free operant sessions dropped by 116.2. The response rates in the other three conditions, however, increased, although responding for peer praise was still below that of the free operant sessions. However, Table 3 shows an increase in the difference scores between peer praise and the free operant condi-

tion of 81.2; from Phase III a) sessions to Phase III b) sessions.

Responses for adult social reinforcement also increased and surpassed the rate obtained in the candy reward, peer pairing sessions.

Summarized data for subject S2 is presented in Figure 3 and Figure 4 and in Table 1 and Table 2. Subject S2 also showed an increase in response rates for peer praise, although this increase was below the increase obtained in responding during the free operant sessions. Thus peer praise was not enhanced by pairings with candy reward. However, the response rate for candy and peer praise also increased, remaining well over the free operant level. Thus the peer praise did not detract from the influence of candy reinforcement for this subject but may have enhanced it. Responding for adult praise continued to decline well below the free operant level (see Table 3).

Supplemental Procedure I and Results

Subject S4 was involved in an experimental probe because of the response characteristics consistently emitted in the first sessions of each condition in Phase I. After the initial cue, the subject emitted a burst of responses for either an approximate thirty second period or until the first presentation of verbal praise from either the adult or peer occurred. The subject then ceased to respond, and sat behind the table staring at her fingers. Upon presentation of the five minute cue, the same phenomena reoccurred.

This behavior pattern occurred during the baseline sessions, and during the first two days of the Phase I conditions. It was therefore decided that an experimental probe would be introduced to determine whether or not the presentation of adult or peer praise could influence the behavior of the subject. The problem, it was believed, was that

the subject did not respond long enough or frequently enough to receive adequate reinforcement from the reinforcing agent needed to develop the association between lever pressing and social praise. Subsequent sessions involved the presentation of a verbal cue, "you can press the lever if you want", over an intercom system every time the subject refrained from responding for a period of one and one-half minutes. This duration was selected because the subject typically responded for less than thirty seconds, and the one and one-half minute lapse that occurred usually coincided with a click on the instrumentation panel signalling a minute print out of session responses. It was also determined that once the subject emitted lever responses spontaneously, the number of cues presented on a given day would be determined by the number required on the first session of a given day. Thus the subject's behavior would determine any fading out of the verbal cues that would be presented to her. Since the verbal prompting cues were constant within daily sessions, the relative effectiveness of the peer and adult social praise could still be evaluated.

Results

The results of the experimental probe are presented in Figure 7 and Figure 8 and in Table 5 and Table 6. The experimental probe, initiated after two experimental session days, terminated after twelve session days due to operational difficulties. These twelve days were broken up into the following phases, for each condition; phase I entailed five sessions of presenting verbal cues to the subject at two minute intervals; phase II entailed two sessions in which the number and the time of presentation of verbal cues was determined by the subject's performance during the first session of each experimental day;

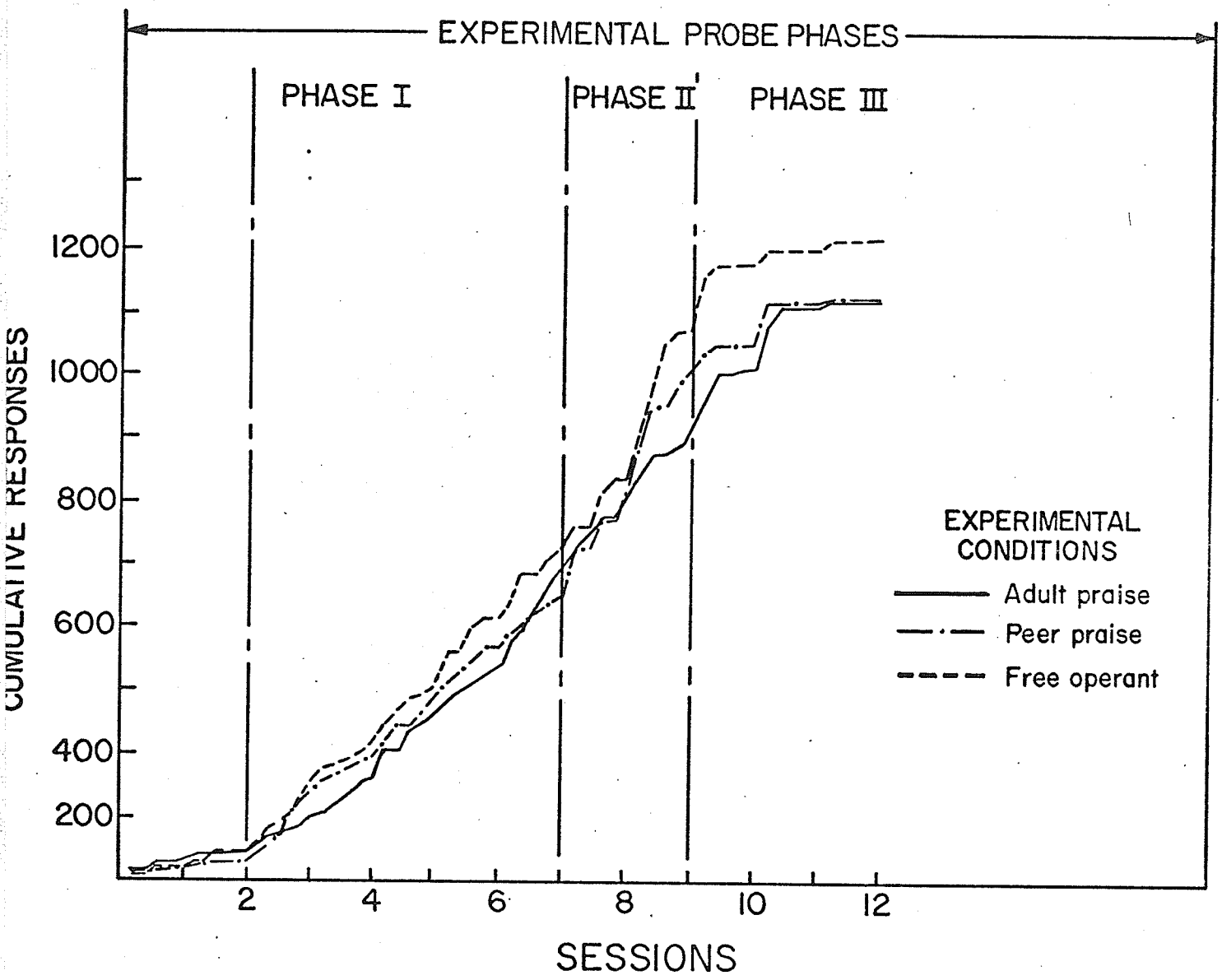

Figure 7. Cumulative Key-pressing Responses per Session of S4 During Phases of Experimental Probe

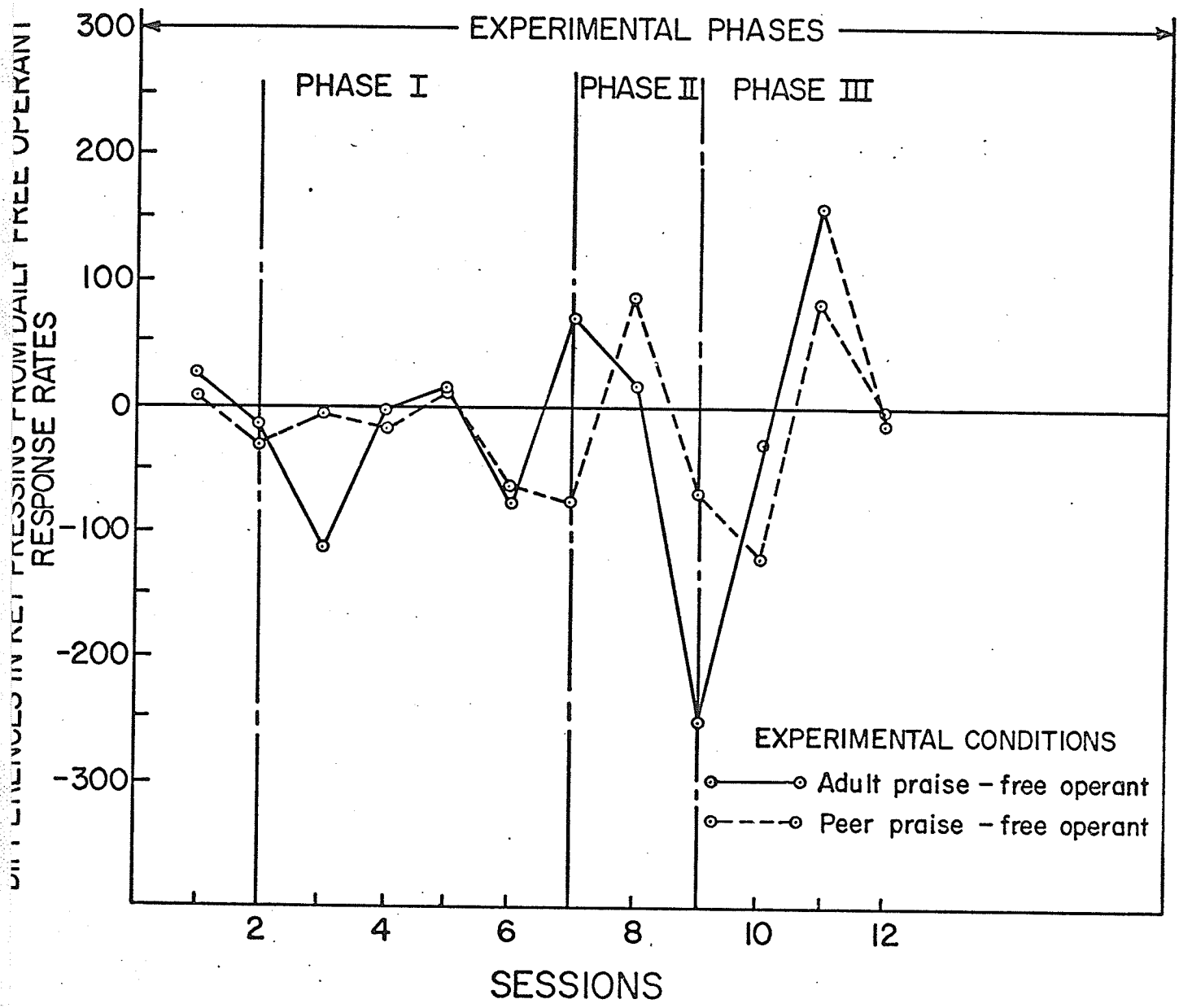

Figure 8. Comparison of Difference Scores of S4 Between Experimental Conditions and in Experimental Probe Phases

TABLE 5

Mean Difference Scores of Subject S4 - Comparing Response Rates During Adult and/or Peer Praise Sessions with the Free Operant Response Rates During the Experimental Probe Phases

Experimental Phase	Sessions	Difference Scores Derivations	
		$\overline{X}(P-F)^a$	$\overline{X}(A-F)^b$
	1 - 2	-11	6
Phase I	3 - 7	-47	-55.6
Phase II	8 - 9	8	-118.5
Phase III	10 - 12	-19.3	35.6

[a] $\overline{X}(P-F)$ = Sum of daily difference scores between peer praise sessions (P) and free operant sessions (F) ÷ number of sessions per phase.

[b] $\overline{X}(A-F)$ = Sum of daily difference scores between adult praise sessions (A) and free operant sessions (F) ÷ number of sessions per phase.

TABLE 6

Average Response Rates of Subject S4 in
Each Experimental Condition During the Experimental Probe Phases

Experimental Probe Phases	Sessions	Experimental Conditions		
		Free Operant	Peer Praise	Adult Praise
	1 - 2	46	33.5	52
Phase I	3 - 7	199.4	166.8	177.2
Phase II	8 - 9	342.5	350.5	224
Phase III	10 - 12	101.3	82	137

and phase III entailed three sessions of no verbal cues, other than the initial cue that was given at the start of the session.

Table 5 and Figure 7 present the response characteristics of the subject during the experimental probe. The introduction of verbal cues from sessions three to seven resulted in a dramatic increase in the response rate of the subject in all conditions. Responding during the free operant sessions was highest. However, the subject typically stopped responding after the second or third presentation of verbal praise from either reinforcing agent, (approximately thirty seconds after the cue was presented). Towards the end of this phase, the subject started to emit spontaneous responses, and responded longer after the verbal cue, when presented, during the free operant sessions. Phase II of the experimental probe was therefore introduced, i.e. number of verbal cues to be presented was determined by the behavior of the subject in the first session of each experimental day. This phase was in effect for two session days, the subject emitting spontaneous responses in all three conditions on session day eight. From session day nine to twelve, no verbal cues were given other than the initial cue at the start of each session.

From the figures and tables it is evident that neither adult or peer praise was effective in increasing the response rates of the subject in these respective conditions above the free operant level consistently throughout the experimental probe. The relative influence of the peer and adult praise is best presented in Figure 8. Although the subject responded more than the free operant levels on approximately half of the sessions, the level of responding below the free operant level was greater than the level of responding above the free operant. Table 5 presents the corresponding mean values of the difference scores

for the experimental probe phases which numerically depicts this phenomenon. It may be noted that the relative influence of peer praise and adult praise shifted from one experimental probe phase to another, and thus there was little consistency in the subject's performance.

As is evident from Figure 7, the response rates of the subject gradually extinguished during phase III. The presentation of peer and adult praise had only little reinforcement effect, the extinction curves being slightly slower for both conditions than during the free operant.

Thus, it was concluded that for subject S4, verbal praise from either an adult or a peer, had little influence on the behavior of this subject. Rather, the subject's behavior was controlled, for the most part by the cues presented by the author, the termination of which resulted in the performance of the subject returning to pre-probe level.

Considering the results of the probe, future research could entail the verbal cues to press the lever being presented by the "reinforcing agent". The intensity of these cues could gradually fade out. In this way, evaluation of the relative effects of peer and adult influence on the behavior of this type of subject might more validly be evaluated.

Supplemental Procedure II and Results

During Phase III a), an evaluation of the relative effects of different adult experimenters was made on subjects S1 and S2. Butterfield and Zigler (1965) suggested that different experimenters may have differential effects on subjects in relation to reinforcement effectiveness. Since the adult social praise condition was not subject

to any experimental manipulations during this phase of the study, and since the previous sessions provided an adequate baseline of performance for the female adult, an attempt was made to systematically replicate the findings of Butterfield and Zigler.

On the twenty-fourth experimental day for subject S1, and on the twentieth experimental day for subject S2, a male adult was substituted as the adult reinforcer. The male adult was present for two experimental sessions with subject S1 and for four experimental sessions with subject S2, after which the female adult was reinstated. The duration of the male adults participation was brief due to a sudden change in the working shifts of the male adult.

Results

Prior to the presentation of male adult social praise for lever responses, subject S1 was responding well above the free operant level for female adult social praise (a mean response rate of 425 was obtained for three sessions, prior to male adult social reinforcement compared to mean response rate of 231.3 obtained during the corresponding free operant sessions). However, during the subsequent two sessions in which the male adult was present, the response rate of the subject increased to a mean response rate of 700 responses. However, during these experimental days, the free operant response rate also increased to a mean value of 620 responses, thereby indicating a decrease of effectiveness of male reinforcement from female reinforcement. (Mean difference scores of 80 and 193.7 respectively). Subsequent reinstatement of the female adult resulted in mean response rate of 454.5 and the free operant mean response rate of 373.3, yielding a mean difference score of 81.2 .

Prior to the introduction of the male adult with subject S2, a mean response rate of 255.3 was obtained for three preceding sessions with the female adult. The corresponding free operant mean response rate was 557, yielding a mean difference score of -301.7. The mean response rate of subject S2 for male social reinforcement was 485.5, and a corresponding mean free operant rate of 662.5 yielding a mean difference score of -177.0. Subsequent sessions with the female adult yielded a mean response rate of 615, the corresponding free operant mean being 651.5; mean difference score of 36.5.

From the results, one can conclude that different experimenters do have differential reinforcement effects. However, these effects may not be as drastic as one may be led to believe if one considered only the response rates emitted by the subject in the adult social praise condition alone. This caution is best represented by the results presented for subject S1. Although, responding for adult praise more than doubled for male adult praise, the corresponding increase in responding in the free operant sessions resulted in the male adult being less effective in influencing responding over the free operant level. The initial comparison of just the adult sessions may have been influenced by the subject merely having a "good day" for the male, and also in the other sessions. However, more data, and more replications of this effect should be made before any conclusive statements can be presented.

CHAPTER V

DISCUSSION

From the results presented in this study one can conclude: (1) Two subjects, subjects S1 and S2 clearly demonstrated that the presentation of candy for lever pressing on a variable interval schedule was, indeed, reinforcing. The response rates under the candy reinforcement were, for both subjects, well above the free operant response rates that occurred during this respective condition. (2) Two subjects, S1 and S3, demonstrated the reinforcing influence of adult social praise for lever presses. (3) Only one subject, S3, demonstrated peer praise to be reinforcing, although not as reinforcing as adult social praise. (4) For subjects S1 and S2, the efficacy of peer social praise was not enhanced to the level of being considered "reinforcing" by pairings of peer praise with either adult social reinforcement, or the candy reinforcement.

The finding that pairing peer praise with the presentation of candy reward, proven to be reinforcing for lever presses, had little effect in enhancing the subjects' performance for peer praise alone, is probably the most significant result of the study. Indeed, one would expect this pairing to at least increase the efficacy of peer praise to the free operant level, an increase not obtained in this study. This result poses many questions. For example, what reinforced responding during the free operant sessions? Brown (1971) suggested that there is little about the task of lever pressing that might reinforce further responding. However, this is only an assumption. He used a free operant

base-rate of four twenty second intervals from which he compared the results of his study.

It may be that the response rates of the subjects increased because they may have thought it was expected of them. Or, maybe the subjects responded during the free operant session simply because the lever was there and there was nothing else to do. It may be interesting and worthwhile to determine if during the free operant sessions the subjects would emit some form of behavior in order to obtain the lever. Another possibility would be to structure the availability of an alternative response, other than lever pressing, that the subjects could emit during each experimental condition. The alternative response would not result in social praise, and as such might be a more sensitive dependant variable for the study of social reinforcement effects.

However, in the present study some form of uncontrolled reinforcement did influence lever pressing during the free operant sessions. The behavior patterns of subject S1 during the initial free operant sessions suggested this possibility. Initially, the subject would respond at the start of each free operant session and then slowly extinguish. But, after the subject had become more adept at lever pressing for adult social praise, the response rates during the free operant sessions, increased. During the seventh, ninth, and tenth free operant session, the subject emitted the phrase "good girl" as if to reinforce herself for pressing the lever. There may have been a generalizing effect from the adult session, but on each occasion, adult social praise did not precede the free operant session. A possible control for this possibility may be to set up a series of descriminative cues signifying the respective conditions of the study.

The learning-to-learn effect demonstrated by subject S1 offers a basis for criticism of many studies that incorporate a brief baseline period and follow up with a longer experimental phase. Obviously, subject S1's response rate increased, merely as a function of time and practice. The subject learned to press the lever by alternating her two fore-fingers, and by using the side of her hand, etc. Both these methods resulted in easier depression of the telegraph key over a period of time. Group studies do not necessarily control for this factor as different subjects may require longer or shorter periods of time to develop these short-cut techniques.

The results of this study offer only partial support for the findings of Harter and Zigler (1968). The finding that two of the four subjects studied responded more for adult praise than for peer praise replicated their results, and supports their contention that performance for social reinforcement by institutionalized retardates is relatively specific to attention and praise dispensed by an adult, rather than a more generalized desire for reinforcement dispensed by any social agent; a peer for example.

However, this explanation, based on a social deprivation of adult contact theory, is not sufficient for the present study. The subjects selected for this study were residents in a well established operant conditioning unit which emphasized personal contact of the staff with the residents. In addition, all but one subject had been exposed to these conditions for a period of at least four years, the remaining subject participating in the programs for a period of one year.

A more satisfactory explanation of the results may be derived from anecdotal data compiled by the author while the study was in progress.

During the peer praise for lever responses sessions, the author noted that the frequency of verbalizations on the part of two of the subjects, S1 and S3, increased over the frequency in the other sessions. These verbalizations were ignored by the peer. However, it may well be that in the effort to verbalize, the subjects were emitting competing behavior with lever pressing, which resulted in the relatively lower rates for the subjects involved. A frequency count of the number of verbalizations made by subject S1 during the last five minutes of the sessions on three experimental days showed that no verbalizations were emitted during the adult praise nor free operant sessions, but that the frequency of verbalization during the peer praise sessions was 27, 42, and 33 emissions on the three respective days. An occurrence of verbalization was defined as any audible sound emitted by the subject that could be perceived over the intercom system, preceded by a minimum of five seconds of no verbalizations. The same explanation may account for the results of Terrel and Stevenson (1965) who, although noting the excess verbalizations emitted by the retarded subjects and reinforcing agents, concluded that normal peers were more reinforcing to normal subjects than retarded peers because the retardates were deemed inferior to the normal subjects.

One reason why the subject's verbalization to the peer was frequent, and verbalizations to the adult minimal may be the training histories of the subjects. Typically operant conditioning training sessions require the subjects to sit quietly and attend to the experimenter. The subjects had been exposed to four years of this type of training. Thus, verbalizations, not cued by the adult, were minimal. However, the subjects had no such training in interacting with their peers alone, and as a result verbalizations although not directly reinforced by the peer, occurred,

and may have detracted from the response rates of subjects S1 and S3. This contention is supported by the bahavior of subject S2. Subject S2 did not verbalize with the peer. Although the overall performance of responding for peer praise was not above the free operant level, it was considerably higher than that for adult praise. Any verbalizations emitted by this subject, which occurred frequently (although frequency data on this phenomena were not recorded) occurred in the presence of the adult.

Another possible reason for the lack of social praise effectiveness by the peer may be the lack of variety of the praise statements. The peer, and the adult only emitted the phrase "good girl" every time the stimulus cue was presented. However, this criticism would only hold for subject S2 as increases over the free operant level occurred for subjects S1 and S3 in at least one of the reinforcement conditions.

During the course of the study, the peer missed a total of twenty-two cues for reinforcement. However, considering that approximately forty reinforcements were delivered per session, these misses could not account for the differences obtained re reinforcer effectiveness.

The behavior of the subjects who were exposed to the candy reinforcement condition was surprising. Subject S3 emitted tantrum behaviors when the candy session terminated and had to be eliminated from further study. However, during the few sessions that were successfully completed, the session that immediately followed the candy reinforcement session had a response rate that was substantially higher than in previous sessions. A similar effect was noted for the free operant, adult and peer praise sessions during Phase III a) of the study for subjects S1 and S2. The overall increase in the response rates in

these sessions would appear to offer qualified support for Amsel's frustration theory of non-reward. (Amsel, 1958). However, it must be kept in mind that subject S1 exhibited a continually increasing response rate in the initial three experimental conditions during the phases preceding candy reinforcement.

It may be that the pairing of candy and peer praise did enhance the reinforcing effectiveness of the peer praise when the latter was presented alone. This may have been the conclusion reached if one considered only the response increment to peer praise in relation to previous sessions. However, when compared to the free operant response rates, peer praise was not reinforcing. Amsel's theory of frustrative non-reward could be a possible reason why this result occurred. If the free operant level of responding had remained the same as it was during phase II for subject S1 or phase I for subject S2, then the response increment that occurred for peer praise would have resulted in the conclusion that peer praise had become reinforcing and that the pairing of the peer with candy reward was effective. However, if extinction or termination of candy reinforcement was the reason for the increment in responding during the free operant sessions then one could conclude that peer praise did become reinforcing. This explanation may have held for subject S2, whose response rate for adult praise decreased from the response rate in phase III a), but increased in the free operant and peer sessions. But the same argument would not hold for subject S1 whose response rates increased in all conditions during both parts of phase III.

It may be that something other than mere automatic presentation of candy reward paired with peer praise is required in order to make

peer social praise an effective reinforcer. Possibly if the peer was actively involved in the presentation of the candy reward the desired results would have been obtained. However, this is an empirical question that requires further study.

It was expected that the subjects receiving candy reward for lever pressing would consume the edible immediately upon its presentation. However, both subjects S1 and S2, displayed a great deal of hoarding behavior. The subjects would press the key at a rapid rate, and upon receiving a candy, would pile the candy in a particular spot, only eating the occasional reward. One subject even offered the peer a candy during the sessions in which the peer was paired with the candy. Surprisingly, this response on the part of the subject was ignored by the peer.

The response rates of the different subjects used and the characteristics of the subjects' performance varied greatly between subjects. The subjects were, for the most part, fairly representative of the general population of severely retarded girls that may be found in an institution. Although the subjects did differ extensively from one another, they may each represent different populations of retarded females who have characteristics similar to their own. Research in the area of social behavior and with social reinforcement, must be conducted with this possibility in mind. The chances at the present time of finding a universal technique for developing social behaviors among the retarded are slim. Therefore caution must be taken in generalizing any results that are reported in scientific literature to different subjects and/or differing institutions.

REFERENCES

Amsel, A. The role of frustration non-reward in non-continuous reward situations. Psychological Bulletin, 1958, 55, 102 - 119.

Azrin, N. A., and Lindsley, O. R. The reinforcement of cooperation between children. Journal of Abnormal and Social Psychology, 1956, 52, 100 - 102.

Baer, D. M., and Sherman, J. A. Reinforcement control of generalized imitation in young children. Journal of Experimental Social Psychology, 1964, 1, 37 - 49.

Bijou, S. W., and Baer, D. M. (Eds.) Child development: readings in experimental analysis. New York: Appleton-Century-Crofts, 1967.

Brown, R. A. Interaction effects of social and tangible reinforcement. Journal of Experimental Child Psychology, 1971, 12, 289 - 303.

Burgess, R. L., and Bushell, D. Behavioral sociology; the experimental analysis of social process. New York: Columbia University Press. 1969.

Butterfield, E. C., and Zigler, E. The effects of differing institutional social climates on the effectiveness of social reinforcement in the mentally retarded. American Journal of Mental Deficiency, 1965, 70, 48 - 56.

Chase, L. Motivation of young children: An experimental study of the influence of certain types of external incentives upon the performance of a task. University of Iowa Studies in Child Welfare, 1932, 5, 119.

Dowart, W., Ezerman R., Lewis M., and Rosenhan D. The effect of brief social deprivation on social and non-social reinforcement. Journal of Personality and Social Psychology, 1965, 2, 111 - 115.

Ferster, C. B. Reinforcement and punishment in the control of human behavior by Social Agencies. In McGinnes E. and Ferster, C. B. The Reinforcement of Social Behavior. Boston

Gerwitz, J. L., and Baer, D. M. Deprivation and satiation of social reinforcers as drive conditioners. Journal of Abnormal and Social Psychology, 1958a, 57, 165 - 172.

Gerwitz, J. L., and Baer D. M. The effect of brief social deprivation on behaviors for a social reinforcer. Journal of Abnormal and Social Psychology. 1958b, 56, 49 - 56.

Green, C., and Zigler, E. Social deprivation and the performance of normal and retarded children on a satiation type task. Child Development. 1962, 33, 499 - 505.

Greenspoon, J. The reinforcing effects of two spoken words on the frequency of two responses. American Journal of Psychology, 1955, 68, 409 - 416.

Harter and Zigler. Effectiveness of adult and peer reinforcement on the performance of institutionalized and non-institutionalized retardates. Journal of Abnormal Psychology, 1968, 73, 2, 144 - 149.

Kaufman, M. E. The effects of institutionalization on development of stereo-typed and social behaviors in mental defectives. American Journal of Mental Deficiency, 1967, 71, 581 - 585.

Klaber, M., Butterfield, E. C., and Gould, L. J. Responsiveness to social reinforcement among institutionalized retarded children. American Journal of Mental Deficiency, 1969, 73, 890 - 895.

Kuypers, D., Becker, W. and O'Leary, K. How to make a token system fail. Exceptional Children, 1968, 34, 101 - 109.

Martin, G., England G., and England, K. G. The use of backward chaining to teach bed-making to severely retarded girls, a demonstration. Psychological Aspects of Disability, 1971 - Vol. 18, 1, 35 - 40.

Martin, G., England G., Kaprowy, G., Kilgour, K., and Pilek. Operant conditioning of kindergarten class behavior in autistic children. Behavior Research and Therapy, 1968, 281 - 294.

Martin, Kehoe, Bird and Jensen. Operant conditioning of dressing behavior in severely retarded girls. Mental Retardation, 1971, 9, 27 - 31.

Mitchell, A., and Smeregli. Teach growth in social competence in institutionalized mentally retarded children. American Journal of Mental Deficiency, 1970, 74, 666 - 673.

O'Leary, K. D., and Becker, W. C. Behavior modification of an adjustment class A token reinforcement program. Exceptional Children, 1967, 33, 637 - 642.

Paloutzian, R. F., Hasazi, J., Streifel, J., and Edgar, C. L. Promotion of positive social interaction in severely retarded young children. American Journal of Mental Deficiency, 1971, 75, 4, 519 - 524.

Ross, S. The effects of intentional children in social behavior on retarded children. American Journal of Mental Deficiency, 1969, 73, 912 - 919.

Skinner, B. F. Science and Human Behavior. New York: MacMillan, 1953.

Stevenson, H. W. Social reinforcement with children as a function of CA, sex of E and sex of S. Journal of Abnormal and Social Psychology, 1961, 63, 147 - 154.

Stevenson, H. W., and Cruse, D. B., The effectiveness of social reinforcement with normal and feeble-minded children. Journal of Personality, 1961, 28, 124 - 135.

Stevenson, H. W., and Fahel, L. The effect of social reinforcement on the performance of institutionalized and non-institutionalized normal and feeble-minded children. Journal of Personality, 1961, 136 - 147.

Stevenson, H. W., and Hill, K. T. The effects of social reinforcement and non-reinforcement following success and failure. Journal of Personality, 1965, 33, 418 -

Terrel C., and Stevenson, H. W. The effectiveness of normal and retarded peers as reinforcing agents. American Journal of Mental Deficiency, 1965, 70, 373 - 381.

Ulrich, R., Stachnik, T., and Mabry, J. (Eds.) Control of Human Behavior. Glenview, Ill.: Scott, Foresman, 1966.