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THE EFFECT OF THERAPEUTICALLY ORIENTED INSTRUCTIONS AND SELF-MONITORED FEEDBACK ON A LOW PROBABILITY (PHOBIC) BEHAVIOR

by

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ABSTRACT

In two preliminary and one main study, the effect of self-monitored feedback and therapeutically oriented instructions on a low probability (phobic) behavior was examined. The preliminary studies established that an observational methodology could be fruitfully employed in an investigation of phobic behavior.

In the main study twenty-eight rat phobic female volunteers were exposed to conditions of: self-monitored feedback, therapeutically oriented instructions, self-monitored feedback x therapeutically oriented instructions, and a control condition. It was found that the variable of self-monitored feedback significantly increased observational durations while no significance was demonstrated for either the therapeutically oriented instructions or interaction factors. The results suggest the importance of feedback as a behavior control variable.

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CHAPTER I

INTRODUCTION

During the past ten years there has been a large number of studies demonstrating the value of behavior therapy in the treatment of human behavioral disorders (Bandura, 1969; Eysenck, 1960; Franks, 1969; Ullmann & Krasner, 1965; Wolpe & Lazarus, 1966). The behavior therapies, which are variations of systematic desensitization (Wolpe, 1958) and operant conditioning (Skinner, 1953), may be typified by several common features: (1) precise specification of the behavior to be changed, (2) precise specification of the procedure to be used in attempting to change the behavior, and (3) frequent monitoring of the behavior to determine the effects of the procedures. If the patient has a sufficiently well developed behavioral repertoire which allows him to make subtle discriminations the third feature makes it possible for him, as well as the therapist, to continuously monitor his own behavior and receive feedback throughout the course of therapy. It has been suggested that the feedback provided to a patient may be a significant factor in the reported successes of the various behavior therapy procedures (Leitenberg, Agras, Thompson, & Wright, 1968).

This feedback may take the form of the patient reaching a more advanced step in an anxiety hierarchy, receiving praise from the therapist, or being given material reinforcement (Agras, Leitenberg, & Barlow, 1968). Feedback, as used here, refers to the occurrence of any response contingent stimulus. It is not a necessary condition of this stimulus that it be caused by the response, merely that it follow the response closely in time. The consequences of behavior may alter behavior regardless of how or why they follow behavior (Skinner, 1966a). In many cases this response contingent stimulus either functions as or is associated with some type of reinforcement or punishment. A response contingent stimulus may be designated a reinforcer or punisher only after its effect on behavior is observed. A reinforcer is a response contingent stimulus which increases future instances of the behavior it follows. A punisher is a response contingent stimulus which decreases future instances of the behavior it follows. Both reinforcers and punishers are special classes of feedback. Reinforcement is always feedback, but feedback is only reinforcement if an increase in behavior is observed.

In its general usage, feedback refers to a stimulus which indicates a change in behavior. This definition appears too narrow since an indication that no change in behav-

ior has occurred must also be considered feedback. Therefore, as the term is used here, feedback will refer simply to the occurrence of a response contingent stimulus, regardless of its effect on behavior.

It has been suggested that, in behavior therapy, the effects of feedback may be facilitated by the use of "therapeutically oriented instructions" (Leitenberg, Agras, Barlow, & Oliveau, 1969). Such instructions, which suggest to the patient that the therapy is effective and that his behavior will improve, get the patient to observe his behavior.

While it has never been clearly articulated what is meant exactly by therapeutically oriented instructions, it must be assumed that they are instructions which indicate to the patient that improvement in his behavior is likely. Therefore, it may be said that therapeutically oriented instructions, like instructions in general, specify appropriate behaviors. Therapeutically oriented instructions, are a special class of instructions which are therapeutic in that they specify a positive behavior change. Instructions in general simply specify appropriate behaviors. It is not necessary that the specified behaviors be therapeutic. The Vermont Group (Agras, Leitenberg, & Barlow, 1968; Leitenberg, Agras, Barlow, & Oliveau, 1969; Oliveau, Agras, Leitenberg, Moore, & Wright, 1969) has argued that therapeutically or-

ienting instructions and behavioral feedback are crucial variables and may be primarily responsible for the reported successes of the behavior therapies. This view, which would seem to have important implications both theoretically and practically for the behavior therapies, has not been experimentally verified.

Statement of the Problem

Both feedback and instructions which specify behavioral change have been studied in a variety of situations. The behavior therapy literature, however, is lacking in studies wherein the effect on behavior of feedback and instructions has been investigated in a systematic and unconfounded manner. It remains unclear whether behavior can be significantly modified by a procedure in which either feedback or instructions is used exclusively, or whether both variables in combination are necessary for a significant behavioral change to occur. While there is some suggestion in the literature that each variable may contribute to the effectiveness of behavior therapy, to date neither feedback nor instructions has been independently manipulated. So it still remains unclear whether either feedback or instructions are sufficient, by themselves, to significantly modify behavior.

Feedback

The importance of feedback in therapy has been stressed by Kanfer (1966, 1967), who has constructed a therapeutic system around the concept of self-monitoring. Kanfer (1967) contends that an individual's behavior may be controlled when immediate behavioral feedback is available. Through self-monitoring, the individual is provided with this feedback and can identify the effect and consequences of his behavior. The self-monitoring procedure may consist of an individual simply keeping a record of the frequency with which he engages in a to-be-controlled behavior or it may entail an individual observing his behavior via electronic equipment. This focusing of attention on behavior provides the feedback which enables the individual to specify some of the variables of which his behavior is a function and enables him to bring it under his control. Several clinical studies have been reported in which successful results have been obtained through the use of self-monitored feedback.

Fordyce, Fowler, and Delateur (1968) using a self-monitoring procedure in combination with social reinforcement, successfully modified the behavior of a bedridden hospital patient. Fox (1966) found that requiring his students to monitor their study behavior had a significant

effect in increasing the amount of time spent studying.

In smoking studies (Grimaldi & Lichtenstein, 1969; Gutman & Marston, 1967; Keutzer, 1968; Nolan, 1968; Pyke, Agnew, & Kopperud, 1968; Rutner, 1967; Tooley & Pratt, 1967; Whitman, 1969) subjects exposed to self-monitored feedback and other variables significantly reduced smoking behavior. In several of these studies not only did self-monitored feedback significantly reduce behavior but also achieved results comparable to other forms of treatment (Grimaldi & Lichtenstein, 1969; Gutman & Marston, 1967; Keutzer, 1968; Whitman, 1969). Self-monitored feedback was found to be an important variable in the modification of over-eating behavior (Harris, 1969; Stollak, 1967; Stuart, 1967). In a similar study, self-monitored feedback proved sufficient, after a period of time, to maintain a significant weight loss in the absence of external reinforcement for a period of five months (Moore, 1969).

Rutner and Bugle (1969) report successful results in eliminating reported hallucinations in a hospital patient. The procedure required the patient to monitor her behavior on a recording chart. The chart in addition to functioning as a feedback device, also served as a discriminative stimulus for social reinforcement. Leitenberg, Agras, Thompson, and Wright (1968) exposed two patients suffering from anor-

exia nervosa to a treatment procedure combining self-monitored feedback and positive reinforcement. The patients monitored the amount of food they consumed and graphed their results. It was found that withdrawing positive reinforcement had little effect on behavior. The authors suggest that the self-observed signs of progressive improvement, which were provided by the self-monitoring procedure, maintained the behavior in the absence of other explicit reinforcers. In a similar study (Agras, Leitenberg, & Barlow, 1968) two phobic patients were treated by self-monitored feedback. It was demonstrated that approach toward the phobic object was facilitated by the behavioral feedback received. Since it was found that the manipulation of contingent social reinforcement did not significantly affect the behavior, the authors suggested that the reinforcing and discriminative functions usually filled by social reinforcement were adequately provided by self-monitored feedback.

Feedback has been demonstrated to exert a controlling influence over non-fluent verbal behavior. Goldiamond (1965), using delayed auditory feedback as a stutter-produced aversive stimulus, found that rate of stuttering decreased while a new pattern of fluent verbal behavior developed. In several other studies where auditory feed-

back was manipulated (Burke, 1969; Cherry & Sayers, 1960; Soderberg, 1968; Yates, 1963) it was generally found that rate of stuttering was a function of auditory feedback available to the subject.

Self-monitoring by means of electronic feedback has been employed to furnish group therapy members with feedback of their behavior (Danet, 1969; Schwitzgebel, Schwitzgebel, Pahnke, Hurd, 1964). The results indicate that the feedback had a significant effect on the verbal behavior of the therapy group members.

In a procedure using physiological feedback (Valins & Ray, 1967), snake phobic subjects were exposed to heart rate feedback while being presented with slides of fearsome snakes. The results indicate that those subjects who received feedback suggesting that their heart rates were unaffected by the snake stimuli, significantly modified their approach behavior toward snakes, even when this information was false.

While these clinical studies suggest that self-monitored feedback may function as an important behavioral change variable, their results must be interpreted with reservation. In none of the cases reviewed has self-monitored feedback been the only variable acting on behavior. Because individuals in these studies had been

exposed to such additional variables as therapeutic instructions, positive reinforcement and aversive stimuli, it is not possible to discriminate the changes that were primarily due to feedback from those that were brought about by exposure to these other variables.

While not directly relevant to clinical application, the experimental literature more clearly suggests the degree of control that may be exerted by feedback over behavior. That feedback can function as a conditioned reinforcer has been empirically demonstrated by pairing feedback with an unconditioned reinforcer (Bugelski, 1938; Skinner, 1938). Ayllon and Azrin (1966) have demonstrated that feedback may serve a discriminative function. When response-produced feedback was followed by reinforcement, subjects were found to respond under the control of the feedback stimulus. When responses were no longer followed by feedback, subjects changed over to an operandum to which feedback was provided, indicating the control exerted by the feedback.

An organism's overt responses generate stimuli. These response-produced feedback stimuli can come to control other of the organism's responses. Pigeons on a chained schedule of reinforcement, in which a high rate of responding during the first component should be followed by a low rate of responding during the terminal component (e.g. Chain FR50 DRL6),

repeatedly demonstrated the effect of the response produced feedback stimuli of the first component of the schedule, by the occurrent of brief high rates of responding (FR runs) during the terminal component of the schedule. The behavior in the terminal component was under the control of stimuli generated by the pigeon's behavior in the first component (Thomas, 1967). Similar behavior has been observed under mixed schedules (Ferster & Skinner, 1967; Keehn, 1965). The importance of response generated stimuli has also been demonstrated in regard to avoidance schedules (Bolles & Popp, 1964) with results suggesting that little avoidance learning takes place in the absence of such feedback.

Holz and Azrin (1961) have shown that the feedback associated with punishment can function as a discriminative stimulus (S^D); i.e. control responding in its presence and non-responding in its absence. Punishment in the form of response-produced electric shocks can acquire either S^D or S^Δ functions depending on whether the shocks are paired with positive reinforcement or with extinction (Holz & Azrin, 1961, 1962; McMillan & Morse, 1967). Using psychiatric patients, Ayllon and Azrin (1966) found that a stimulus which originally suppressed behavior, could be used to facilitate behavior.

Hake and Azrin (1969) suggest that in addition to exerting stimulus control over behavior and reinforcing behavior, feedback may also control the temporal spacing of responding. Additional studies on response distributions under temporally defined schedules have been reported (Davis & Wheeler, 1967); Hodos, Ross, & Brady, 1962; Laties, Weiss, & Weiss, 1969; Nevin & Berryman, 1963; Segal-Rechtschaffen, 1963).

Several physiological studies have also demonstrated the role of feedback in controlling behavior. It was found that the amount of heart rate control which can be exerted by the individual is a function of the amount of feedback monitored. (Brener, Kleinman, & Goesling, 1969; Brener & Hothersall, 1967; Engal & Hansen, 1966; Hnatiow & Lang, 1965; Lang, Sroufe, & Hastings, 1967). These results seem to indicate that even an "involuntary behavior" such as heart rate may be regulated by the use of feedback. Thus, it would seem that when naturally occurring response feedback has proved insufficient for the development of control over behavior, the feedback may be made effective by making it more observable.

Instructions

Like feedback, the effect of instructional variables on behavior has been subjected to a number of clinical and

experimental investigations. According to Skinner (1966a) when a subject is exposed to a set of instructions it is as though the reinforcement contingencies are being described rather than experienced, with the subject simply being told to respond in a given way. Rather than establishing stimulus control over the subject's behavior, the subject is expected to behave as if such control has already been established. From this point of view, instructions function as discriminative stimuli which may specify appropriate responding. Instructions may thus improve behavioral efficiency in terms of maximizing reinforcement (Skinner, 1966a). Instructions describe a set of contingencies to the listener. This description of the contingencies, acting as discriminative stimuli, may result in behavior which resembles behavior generated by actual exposure to the contingencies (Skinner, 1966b). Kaufman, Baron, and Kopp (1966) found that instructions exerted even more of an influence over subjects' behavior than the actual reinforcement schedules to which they were exposed. Subjects were given either complete or partial instructions about required responses and either accurate or false information about the reinforcement schedule. The results indicate that subjects given false schedule information generated response rates appropriate to that schedule.

Comparable results have been reported by Dulany (1968) and Lippman and Meyer (1967).

The role of instructions in avoidance learning has been discussed by Ader and Tatum (1961) who found that under a Sidman avoidance procedure, human subjects given no instructions about the procedure showed qualitative and quantitative differences in performance, with approximately 50% of the subjects failing to acquire the avoidance response at all. Baron and Kaufman (1966) report that instructions facilitated avoidance behavior. Subjects established stable avoidance behavior only when specific instructions about appropriate responding were provided. Similar results have been reported by Turner and Solomon (1962).

Instructions have been demonstrated to play an important role in studies on respondent conditioning. In a G.S.R. study, subjects instructed that they would receive shocks showed increased G.S.R. readings when a CS was presented. When subjects were told that they would receive no more shocks, readings were reduced (Cook & Harris, 1937). Spence and Goldstein (1961) report on the results of instructions on eyeblink conditioning. Chatterjee and Eriksen (1962) have demonstrated similar results with heart rate. Sternbach (1964) suggests that instructions given to subjects about the purpose of an experiment are sufficient to in-

fluence autonomic responding. Subjects informed about what type of reactions to expect from shock accompanied noise reliably demonstrated the expected reactions as measured by E.K.G. and Palmer skin resistence. In a second study, subjects given pills were exposed to placebo, stimulant and relaxant instructions. A measure of gastric motility revealed that the peristalic waves of the subjects were representative of the instructions received.

Instructions have been shown to facilitate the effect of positive reinforcement. Ayllon and Azrin (1964), in a study using psychiatric patients, found that when instructions were added to a reinforcement procedure, behavior which was apparently unaffected by the reinforcement contingencies immediately increased in frequency. Instructions were also found to be effective in increasing smiling in a retarded boy (Hopkins, 1968) and non-bizarre verbal behavior in psychotics (Meichenbaum, 1969).

Several investigations suggest that instructions exert such powerful control over behavior that under controlled conditions, subjects will go to such lengths as picking up poisonous snakes and retrieving pennies from nitric acid to comply with instructions given to them by an experimenter (Orne & Evens, 1965). Orne (1969) feels that not only explicit instructions, but also the subtle cues

that a subject in an experiment receives, are crucial variables of any experiment and comprise the "demand characteristics" of an experiment. It has been demonstrated that the manipulation of "demand characteristics" can produce results comparable to those obtained under conditions of sensory deprivation (Orne & Scheibe, 1964). Gustafson and Orne (1965) found that G.S.R. lie detector responses could be manipulated by altering demand characteristics in the form of instructions to subjects. Barber (1961) proposes that many if not all behaviors characteristic of hypnosis may be brought about in "suggestible" subjects merely by the use of instructions. It makes little sense, however, to discuss the suggestability of the subjects, when what is actually of concern is the effectiveness of the instructions. The suggestability of the subjects is, after all, only a description of the subjects' response to the instructions.

The importance of instructional variables is further supported by the research of Schachter and Singer (1962) which indicates that when somatic arousal occurs the direction behavior will take may be a function of instructions received. Subjects aroused by epinephrine and provided with films and other discriminative stimuli behaved in accordance with these stimuli. The results suggest that,

under conditions of arousal, if a subject is given instructions concerning his behavior, he will exhibit behavior appropriate to the instructions he receives.

Like the feedback studies reviewed, the literature on instructions has been confounded by the presence of additional and uncontrolled variables. In none of the studies reviewed have instructions been the sole variable acting on behavior. It still remains to be demonstrated that instructional variables, acting alone, are sufficient to significantly modify behavior.

Instructions and Feedback

While the literature may indicate that instructions might be effective in bringing about behavioral changes, it also suggests that this effectiveness may be reduced if reinforcement is not provided for the behaviors specified by the instructions (Ayllon & Azrin, 1964; Hopkins, 1968). There is, however, evidence which indicates that explicitly programmed external reinforcement might not be necessary in situations where a combination of self-monitored feedback and instructions is employed. Under such situations it would seem that appropriate instructions fulfill certain antecedent conditions for making feedback function as a reinforcer. It may be that in such cases instructions, response, and feedback may be conceptualiz-

ed within the operant framework of the three term contingency: S^D, response, and reinforcement.

Control treatments, in which subjects participate in a therapy program and receive only therapeutically oriented instructions and self-monitored feedback, appear to be as effective in controlling cigarette smoking behavior as the actual therapeutic treatments in which reinforcement is provided (Bernstein, 1969; Keutzer, 1968). Lang, Sroufe, and Hastings (1967) demonstrated that a combination of instructions and feedback can regulate and exert control over heart rate variability. Subjects receiving feedback and instructions achieved significantly better results than subjects without feedback. Those subjects who received a combination of feedback and instructions reduced heart rate variability significantly more than subjects who received only feedback. Further support for the superiority of a combination of feedback and instructions comes from Baron, Kaufman, and Stauber (1969) who demonstrated that differential behavior on a multiple fixed-interval schedule can be rapidly established and maintained under conditions of instructions and feedback. Their results indicated that feedback facilitated performance under conditions of instruction. When instructions about reinforcement contingencies were not made available to subjects, reactions to the actual cont-

ingencies were not precise and showed little resemblance to the actual contingencies. However, instructions about contingencies together with feedback, resulted in behavior similar to what would be expected from the actual contingencies. Commenting on similar results, Staddon (1969) suggests that the information contained in a set of instructions can be of use to the organism in the control of his behavior only if the organism can differentiate between bits of the information, thus responding to them as S^Ds. It would seem that differential response feedback may facilitate this discrimination. Along similar lines, Skinner (1957) concludes that verbal statements or instructions may be thought of as discriminative stimuli which indicate the desired change specified by the reinforcing agent, but that these discriminative stimuli cannot be effective unless the behavior results in environmental consequences. The literature would seem to suggest that not only programmed reinforcement but also feedback can function as such a consequence.

The role of instructions and feedback in a therapeutic situation has received some attention, in terms of "patient expectations". It would appear that a patient's expectations are actually probabilistic statements concerning his future behavior, and are a function of instructions and other dis-

criminative stimuli which are manipulated by the therapist. Instructions that effect favorable expectations about the outcome of therapy are instructions which specify a positive behavioral change. As such they may be considered therapeutically oriented. Frank (1961), Frank, Gliedman, Imber, Stone, and Nash (1959), Goldstein (1962), and Heller and Sechrest (1966) have discussed the role of patient expectancies and their effect on the outcome of psychotherapy. They feel that there exists a strong positive relationship between a patient's expectation of improvement, and his subsequent improvement. It has been suggested that the results of systematic desensitization may be a direct function of a patient's expectations (Marcia, Rubin, & Efran, 1969). From this point of view, patients come into therapy "anticipating" that exposure to a phobic object will result in fear reactions. As a result of a "therapeutic atmosphere" and a structured procedure that "convinces" them that their behavior can be modified, their behavior actually begins to undergo a change which is consistent with these newly acquired "expectations" (Marcia, Rubin, & Efran, 1969). Whether it is stated that the therapist is "convincing" or the patient merely "suggestible", the operations appear to be the same. The patient's verbal behavior is modified by instructions which are therapeutically oriented. An oper-

ant point of view would suggest that, as a result of the phobic responses exhibited by the patient under similar circumstances in the past, the patient's verbal behavior indicates that there is a high probability of the exhibition of similar phobic behavior in the present. By the manipulation of instructions and other discriminative stimuli in addition to providing feedback via a structured procedure, the therapist modifies the patient's verbal behavior concerning the phobic object, which in turn leads to a similar change in non-verbal behavior.

The data of Marcia, Rubin, and Efran (1969) indicate no significant difference in results between the treatment of snake and spider phobics under conditions of systematic desensitization and a procedure (T-scope therapy) which embodied most of the expectancy manipulating features of desensitization without the technical elements of the procedure (relaxation, visualization and construction of an anxiety hierarchy). These results support the view that receiving therapeutic instructions that suggest that a change in behavior will occur and being exposed to feedback, in this case polygraph reports, that indicate that a change has occurred are sufficient conditions to reduce phobic behavior. Similar findings are reported by Paul (1966) in his study of desensitization. Subjects exposed to an

attention-placebo condition in which they received therapeutic instructions and feedback achieved significantly better results than untreated controls.

So it would seem that under a graduated behavior therapy the individual is exposed to constant feedback. This feedback is made possible by the step-like requirements of the therapeutic procedure. The feedback informs the individual that his behavior may be undergoing a change. The importance that the individual attributes to this change may be a function of the therapeutically oriented instructions he has received.

It is suggested that these self-observed signs of improvement made possible by therapeutic instructions and self-monitored feedback may account for much of the reported successes of graded behavior therapies like systematic desensitization and operant shaping (Agras, Leitenberg, & Barlow, 1968; Leitenberg, Agras, Barlow, & Oliveau, 1969; Leitenberg, Agras, Thompson, & Wright, 1968; Oliveau, Agras, Leitenberg, Moore, & Wright, 1969).

If therapeutically oriented instructions and self-monitored feedback are important variables which contributed to the success of the behavior therapies, how much of an influence do they exert? Are they sufficient to modify behavior? If so, are therapeutically oriented instructions

necessary for feedback to adequately function? Is feedback necessary for instructions to have a significant effect?

The literature indicates that both self-monitored feedback and therapeutically oriented instructions may play an important interdependent role in the modification and control of behavior. In the presence of feedback alone, the individual may find it difficult to verbalize the behavior on which the feedback is actually contingent, since many other behaviors are occurring concurrently with the behavior under investigation and thus may be adventitiously affected by the feedback. In such a situation the individual may either find it difficult to verbalize any relationship between the feedback and his behavior, or a spurious relationship between the feedback and some other behavior may be established. Under a system in which therapeutically oriented instructions are used without feedback, the individual may be able to verbalize the appropriate behaviors and reinforcement contingencies specified by the instructions. But in the absence of self-monitored feedback, he might find it difficult to verbalize when and if the specified behaviors were actually occurring. Thus it would seem that in a behavior therapy procedure the presence of a combination

of therapeutically oriented instructions and self-monitored feedback would be optimal. However, the literature also suggests either therapeutically oriented instructions or feedback acting alone may be sufficient to bring about a significant behavioral change.

The present investigation examines the effect of therapeutically oriented instructions and self-monitored feedback, both individually and in combination with each other, on a phobic behavior. The purposes of this investigation were to determine: (1) whether self-monitored feedback and therapeutically oriented instructions, administered separately or in combination with each other, were sufficient to significantly modify phobic behavior, and (2) whether there was a significantly greater effect observed when both self-monitored feedback and therapeutically oriented instructions were used in combination than when each variable was administered separately.

If it is true that therapeutically oriented instructions and self-monitored feedback are powerful variables that contribute to the modification of behavior, it would then follow that the performance of a low probability phobic behavior will be facilitated by exposure to these variables, administered both individually or in combination with each other. If it is true that optimal results

are brought about by the combination of therapeutically oriented instructions and self-monitored feedback, it would also follow that the performance of a low probability phobic behavior would be more greatly facilitated by a combined application of therapeutically oriented instructions and self-monitored feedback than by the individual application of these variables.

CHAPTER II

STATEMENT OF HYPOTHESES

It was hypothesized:

1. For subjects exposed to self-monitored feedback, there would be a difference between the mean time spent observing a phobic object before and after exposure to feedback. This mean difference would be significantly greater than that obtained under a control condition.
2. For subjects exposed to therapeutically oriented instructions, there would be a difference between the mean time spent observing a phobic object before and after exposure to therapeutically oriented instructions. This mean difference would be significantly greater than that obtained under a control condition.
3. For subjects exposed to therapeutically oriented instructions and self-monitored feedback in combination, there would be a difference between the mean time spent observing a phobic object before and after exposure to these combined variables. This mean difference would be significantly greater than that obtained under a control condition.
4. The mean difference obtained under the combined cond-

ition of therapeutically oriented instructions and self-monitored feedback would be significantly greater than the mean difference obtained under the self-monitored feedback condition.

5. The mean difference obtained under the combined condition of therapeutically oriented instructions and self-monitored feedback would be significantly greater than the mean difference obtained under the therapeutically oriented instructions condition.

Preliminary Experiments

Before directly proceeding to test the stated hypotheses it was necessary to answer several questions concerning the methodology to be employed.

1. Was the methodology to be employed one which could discriminate high phobic subjects from low phobic subjects?
2. Would the methodology to be employed produce stable baseline behavior, or would subjects so habituate to it that a change in behavior, which might be a function of an independent variable, would be obscured by intra subject variability?
3. Would the methodology to be employed be stable over time? Would a subject exhibiting low probability phobic behavior at one session exhibit similar behavior at

a later session?

These questions were answered in two preliminary experiments which were conducted prior to the main experiment (see Appendix). The results in general indicate that the observational methodology discriminates between high and low phobic subjects. The results also demonstrate that the methodology produces baseline behavior which is stable not only within session, but also between sessions. After satisfactorily answering the methodological questions, the main experiment was conducted.

METHOD

Subjects

The Ss were 28 female undergraduate students at the University of Manitoba who achieved a score of 50% or more on a rat fear index (Rutner, 1970) which was administered to introductory psychology students. All Ss received experimental credit for participating in the experiment, and none had participated in the preliminary experiments.

Apparatus

The apparatus was located in two experimental rooms separated by a one-way window. A box 2' x 2' x 3' was mounted on a laboratory table (Figure 1). A 3" x 6" viewing slot and cover shutter were located at eye level in the front of the box. A standard microswitch and relay unit was placed

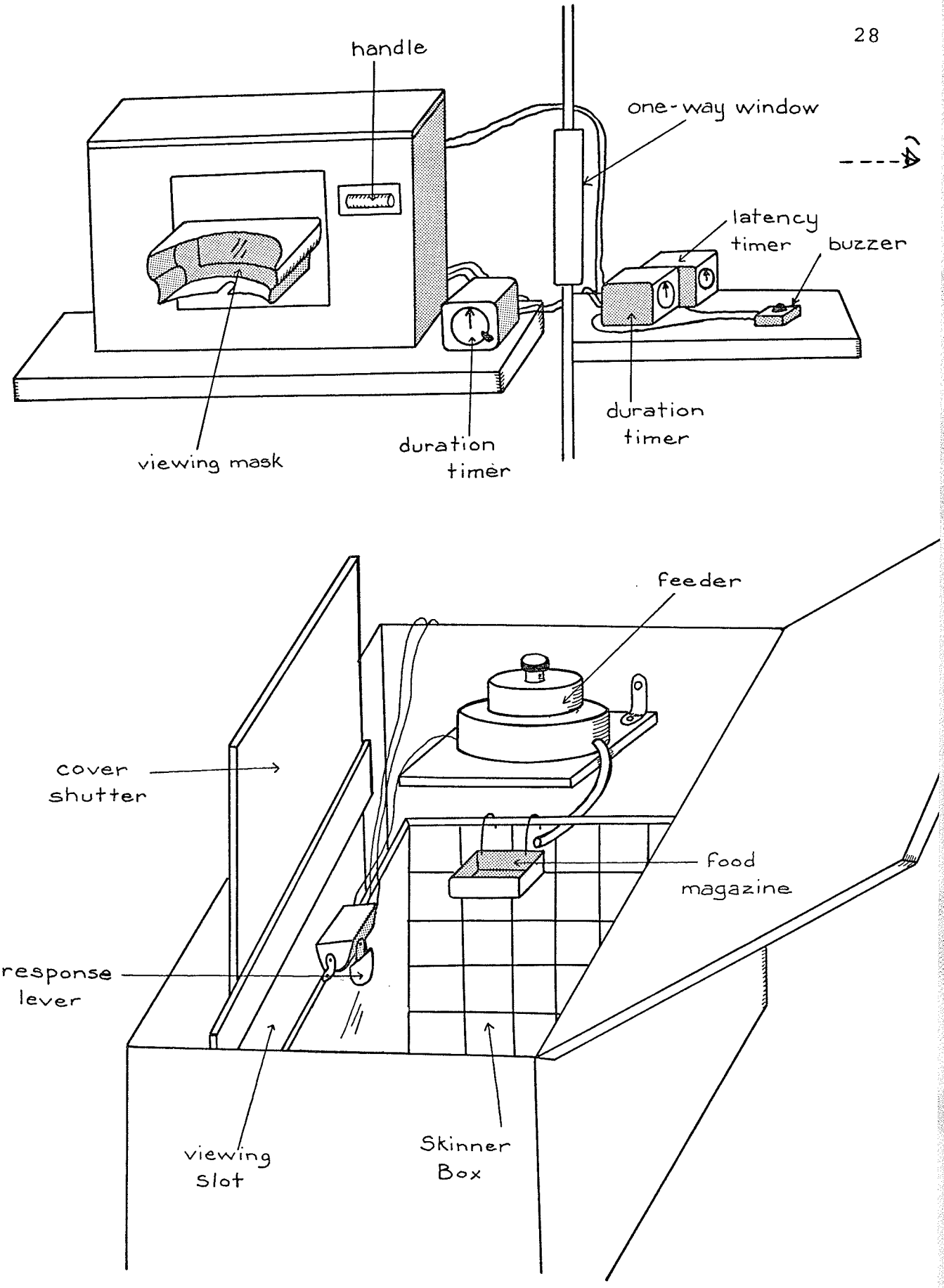

Figure 1. Apparatus.

directly behind the viewing slot and was connected to two automatic timers. One timer was placed on the table next to the box and the other timer was placed in the adjoining observation room. The microswitch and timers were set up in such a way that the activation of a handle to lift the shutter and view the contents of the box tripped the microswitch and activated the timers. In this way, the duration of time a subject was exposed to the contents of the box was reliably and accurately recorded. A third timer was connected to the handle in such a way that it recorded the latency between the sounding of a start signal and the activation of the handle for each trial. The box contained a modified Skinner Box with a clear plexiglass side, which was placed directly in line with the viewing slot and cover shutter. In this way a S looking through the viewing slot could see through the clear plexiglass side and view the contents of the Skinner Box. Unlike that of a conventional Skinner Box, the response lever was made of clear plexiglass and mounted from the top of the chamber. Because of its location, it was necessary for a rat to stand on his hind legs and reach up to press the lever. The food magazine was located on the extreme left side of the Skinner Box with an automatic feeder secured directly above the food cup. A one year old hooded rat at 80% body weight was

placed on a FR20 schedule of reinforcement until a stable rate of responding was maintained. With the location of the response lever and food cup and because of the stable FR20 response rate, an S looking through the viewing slot was presented with a uniform sequence of behavior. The rat would stand on its hind legs and appear to "attack" the clear plexiglass side of the chamber as it pressed the response lever, which was located above the S's line of vision, after 20 responses, the rat would run to the food cup (which was also outside the S's line of vision). After eating the pellet, the rat would run back to the lever, rear on its hind legs and begin the sequence again. Because the rat was maintained on the FR20 schedule, his behavior was uniform not only from trial to trial, but also from S to S.

Procedure

Subjects were given the rat fear index and those female Ss who scored 50% or more were contacted in class to set up appointments for preliminary testing.

Preliminary testing. All Ss were run individually. The Ss were taken into the interview room and given the Wolpe and Lazarus (1966) fear thermometer. After completion of the fear thermometer the Ss were given the rat approach task.

Rat Approach Task

The S was given the following instructions: "I am now going to take you to another room. This room contains a stand on top of which is a rat in a cage. When we get to the room I'd like you to enter the room and approach the cage. You are to approach the rat and then touch him."

The Ss were then taken to the experimental room containing the rat. The room was empty except for a caged rat on a stand located ten feet from the door. On the floor strips of tape indicated distances from the door to the table.

Upon reaching the door the E opened it, turned on the light and directed the S to enter the room alone. The E observed the S's approach behavior and rated it on a 7-point scale.

Entering the room	- 1 point
Advancing within 8 feet of the cage	- 2 points
Advancing within 6 feet of the cage	- 3 points
Advancing within 4 feet of the cage	- 4 points
Advancing within 2 feet of the cage	- 5 points
Touching the cage	- 6 points
Touching the rat	- 7 points

At any point at which the S indicated that she would go no further, the E terminated the approach task. Subjects who

achieved a score of 6 points or more were dismissed from the study. Subjects who scored 5 points or less were escorted into the experimental room containing the viewing apparatus.

Rat Observation Task

The S was seated directly in front of the viewing apparatus and was given the following instructions:

"There is a rat in the box directly in front of you. When I signal to you with a buzzer you are to look into the box, pull the handle, and focus your attention onto the rat. Do not remove your face from the apparatus and keep your eyes open at all times. After each trial there will be a 15 second rest period followed by a sounding of the buzzer which will signal the beginning of a new trial. Now remember when you hear the buzzer, look into the box, pull the handle and focus on the rat. Keep viewing the rat until your arm gets tired holding down the viewing handle."

The E informed the S to wait for the buzzer before beginning the first trial. The E went into the adjoining observation room and began the trials.

Preliminary trials. All Ss during the rat observation task were given five preliminary baseline trials. A trial was defined as the starting and stopping of the timer.

There was a 15 second rest period between the trials. The duration of time the handle was depressed, and thus the time the S was exposed to the rat, was recorded for each trial, as was also the latency between the sounding of the buzzer and the activation of the handle for each trial.

Interview. At the conclusion of the 5th trial, Ss were escorted into the interview room. Subjects who exposed themselves to the rat for 30 seconds or more on any of the five preliminary baseline trials were dismissed from the study. Subjects who exposed themselves to the rat for less than 30 seconds on each of the five preliminary baseline trials were interviewed concerning their performance. All of these Ss who verbally indicated that they found the rat aversive were included in the study. All Ss verbally indicated that they found the rat aversive.

At the conclusion of the interview, Ss were randomly assigned to one of the four conditions: Control (C), Self-monitored feedback (F), Therapeutically oriented instructions (I), and Self-monitored feedback with therapeutically oriented instructions (FI), and experimental trials were begun.

Experimental Trials. At this time appropriate in-

structions were given to each S and 35 experimental trials were conducted and recorded. As in the preliminary baseline trials, there was a 15 second rest period between trials. Any trials in which the S failed to depress the handle within five seconds of the sounding of the buzzer were to be scored 0, but this never occurred. Any response which reached 90 seconds in duration was scored as 90 seconds and the trial was terminated at 90 seconds.

Control Condition

Subjects in the control condition were given the following non-therapeutically oriented instructions:

"We are going to be doing essentially what we did before. I'll sound the buzzer and you look into the box and pull the handle. You said that you stopped the trials before because '_____' (S's verbal response during interview).

I want you to react in the same way during this session." Subjects were then taken into the experimental room and seated in front of the viewing box. The E entered the next room and 35 trials were conducted and recorded.

Self-Monitored Feedback Condition

Subjects in the self-monitored feedback condition were treated like those in the control condition except that, after being seated in the experimental room, E activ-

ated the timer and demonstrated how it worked. He informed the S that she was to check and reset the timer at the conclusion of each trial.

Therapeutically Oriented Instructions Condition

Subjects in the therapeutically oriented instructions condition were given the following instructions:

"You said that you stopped the trials before because '_____' (S's verbal response during the interview). I want you to react in the same way during this session. But, during this session, we are going to be using a therapy that has been very effective in curing various fears and phobias, such as yours concerning rats. It has been found that if a person encounters a fearful or distressing object, he becomes less and less afraid of it and he can look at it for longer and longer periods of time."

The Ss were then taken into the experimental room and seated in front of the viewing box. The E entered the next room and 35 trials were conducted and recorded.

Therapeutically Oriented Instructions with Self-Monitored Feedback

Subjects in the therapeutically oriented instructions with self-monitored feedback condition were given the same instructions as the Ss in the therapeutically oriented instructions condition, and the same feedback as Ss in the

self-monitored feedback condition.

At the conclusion of 35 trials, Ss were taken into the interview room and were readministered the fear thermometer, and then regiven the rat approach task. After being cautioned not to discuss the experiment with fellow students, the Ss were dismissed.

Follow-Up

A follow-up testing session was conducted two weeks after the conclusion of the experimental session. At this time the Ss were readministered the fear thermometer, the rat approach task and 5 trials of the rat observation task.

RESULTS

Figure 2 illustrates the mean observational durations for the experimental conditions for each condition across trials. The principal analysis of data was carried out on mean difference scores for each of the four experimental conditions. For each condition the means of the five baseline trials were subtracted from the means of the last five experimental trials. The resulting mean difference scores were then subjected to data analysis. Tables 1-4 present the mean baseline, post-experiment, and difference scores for each of the four dependent variables, measuring:

1) the number of seconds the S observed the rat,
2) the distance that the S approached the rat,

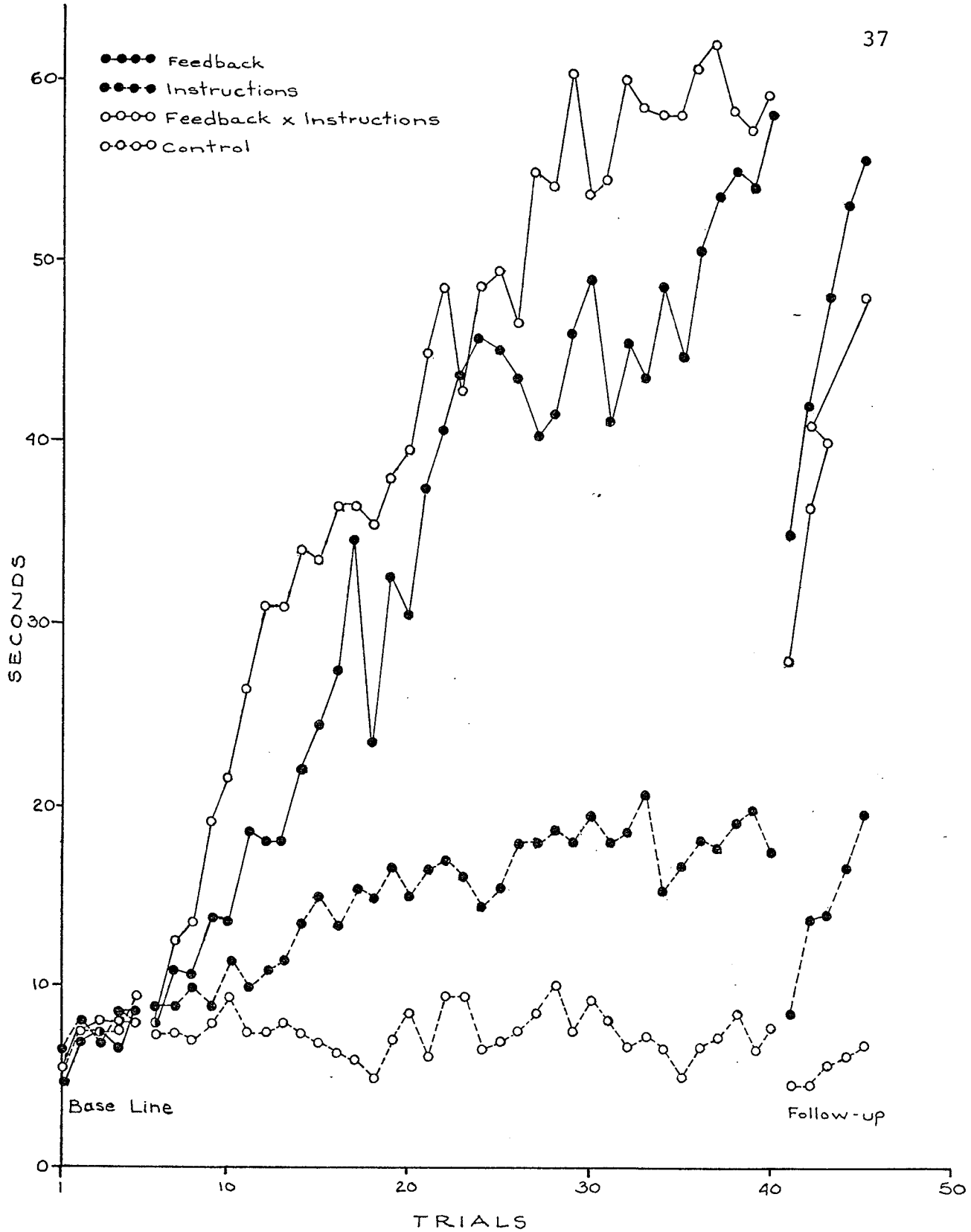

Figure 2. Mean observation response durations across conditions.

Table 1

Means of Baseline, Post-Experiment, and Difference Scores on Rat Observation Task.

Values Given in Seconds.

Condition	Baseline	Post-Experiment	Difference
Instructions	7.7	18.2	10.51
Feedback	6.9	54.2	47.34
Instructions x Feedback	7.4	59.2	51.87
Control	7.4	7.1	-0.34

Table 2

Means of Baseline, Post-Experiment, and Difference Scores on Rat Approach Task. Values Given in Approach Points.

Condition	Baseline	Post-Experiment	Difference
Instructions	4.4	4.5	.14
Feedback	4.4	5.1	.71
Instructions x Feedback	4.3	5.1	.86
Control	4.1	4.0	-.14

Table 3

Means of Baseline, Post-Experiment, and Difference Scores on Latency Times.

Values Given in Seconds.

Condition	Baseline	Post-Experiment	Difference
Instructions	2.72	2.35	.37
Feedback	2.94	2.20	.74
Instructions x Feedback	2.17	1.40	.77
Control	2.23	2.23	.00

Table 4

Means of Baseline, Post-Experiment, and Difference Scores on Fear Thermometer Scores.

Values Given in Points.

Condition	Baseline	Post-Experiment	Difference
Instructions	77.1	57.2	19.86
Feedback	81.4	67.1	14.29
Instructions x Feedback	77.1	50.0	27.14
Control	82.9	70.0	12.86

3) the latency time between the onset of signal and the observation response and,

4) the S's self-report of the magnitude of her fear of rats. The higher the difference score, the greater the approach behavior.

Rat Observation Dependent Variable

Hypotheses 1 and 5 were tested by planned comparisons on rat observation mean difference scores between (1) feedback and control conditions, and (2) instructions x feedback and instructions conditions. Hypothesis 1 stated that there would be a significant difference between the feedback group and a control group. Hypothesis 5 stated that there would be a significant difference between the instructions x feedback group and the instructions group. Both comparisons were found to be significannt ($p < .05$) with F scores of 25.4 and 19.1, both with 1/24 df (Table 5). Thus supporting hypotheses 1 and 5.

A 2 x 2 fixed effects analysis of variance was computed over rat observation mean difference scores (Table 6). This analysis indicated that the factor of feedback had a significant effect, yielding an $F = 45.11$; df = 1/24, $p < .001$. No statistically significant effect was found for the factor of instructions ($F = 1.35$; df = 1/24, $p > .05$) or for the interaction factor of instructions x feedback

Table 5

Planned Comparisons for Rat Observation Mean Difference Scores

Source	SS	df	MS	F
Instructions	415.0281	1		
Feedback	13879.5430	1		
Instructions x Feedback	69.7727	1		
Comparison:				
1.	7824.13	1	7824.13	25.431*
2.	5872.42	1	5872.42	19.087*
Remainder	667.79	1	667.79	2.2
Error	7383.8320	24	307.6597	
Total	21748.1758	27		

*p < .05

Comparison 1 = Feedback-Control

2 = Instructions x Feedback - Instructions.

Table 6

2-Way Analysis of Variance for Mean Difference Scores

Rat Observation

Source	df	MS	F
Instructions	1	415.0281	1.35
Feedback	1	13879.5430	45.11*
Instructions x Feedback	1	69.7727	0.23
Within Cells	24	307.6597	
Total	27		

*p < .001

Epsilon .79

($F = .23$; $df = 1/24$, $p > .05$). The epsilon value for the feedback factor was found to be .79 (Hays, 1963).

Hypotheses 2, 3, and 4 were then tested. Hypothesis 2 stated that there would be a significant difference between the instructions group and a control group. Hypothesis 3 stated that there would be a significant difference between the instructions x feedback group and a control group. Hypothesis 4 stated that there would be a significant difference between the instructions x feedback group and the feedback group. A Scheffé (Hays, 1963) computed on the data for significance with a difference value of 15.93 revealed no significant differences between mean differences of the instructions condition and the control condition, and between mean differences of the instructions x feedback condition and the feedback condition. The mean of the instructions x feedback condition was found to be significantly larger than the mean of the control condition. Thus, hypotheses 2 and 4 were not supported, while hypothesis 3 was supported. It was also found that the mean of the feedback condition was significantly larger than the mean of the instructions condition.

The principal data analysis and hypotheses testing was carried out on the data from the main dependent variable. Since increasing the amount of time Ss observed the rat was

the target behavior, quite naturally it was the main dependent variable. Statistical analysis was also computed on the three other dependent variables.

Rat Approach Dependent Variable

A 2 x 2 fixed effects analysis of variance was computed over rat approach mean difference scores. This analysis, like that of the rat observation data, indicated that the factor of feedback had a significant effect, yielding an $F = 10.37$; $df = 1/24$, $p < .05$. No statistically significant effect was found for the factor of instructions ($F = .77$; $df = 1/24$, $p > .05$) or for the interaction factor of feedback x instructions ($F = .09$; $df = 1/24$, $p > .05$). The epsilon value for the feedback factor was found to be .52 (Table 7).

A post-hoc comparison computed on the data for significance with a difference value of .60 revealed no significant differences between the means of the instructions condition and the control condition, and no significant difference between the means of the instructions x feedback condition and the feedback condition. The feedback condition was found to be significantly greater than the control condition. The instructions x feedback condition was found to be significantly greater than the control condition, and the instructions x feedback condition was found to be significantly greater than the instructions condition.

Table 7

2-Way Analysis of Variance for Mean Difference Scores

Rat Approach

Source	df	MS	F
Instructions	1	0.3214	0.77
Feedback	1	4.3214	10.37*
Instructions x Feedback	1	0.0357	0.09
Within Cells	24	0.4167	
Total	27		

*p < .05

Epsilon .52

Latency Dependent Variable

A 2 x 2 fixed effects analysis of variance was computed over latency mean difference scores. This analysis, like the two previous ones, indicated that the factor of feedback had a significant effect, with an $F = 4.30$; df = 1/24, $p < .05$. No statistically significant effect was found for the factor of instructions ($F = .53$; df = 1/24, $p > .05$) or for the interaction factor of instructions x feedback $F = .39$; df = 1/24, $p > .05$). The epsilon value for the feedback factor was found to be .34 (Table 8).

A post-hoc comparison computed on the data for significance with a difference value of .66 revealed no significant differences between the means of the instructions condition and the control condition, between the instruction x feedback condition and the feedback condition, and between the instructions x feedback condition and the feedback condition. The feedback condition was found to be significantly greater than the control condition, and the instructions x feedback condition was found to be significantly larger than the control condition.

Fear Thermometer Dependent Variable

A 2 x 2 fixed effects analysis of variance was computed over fear thermometer mean difference scores. This analysis indicated no statistically significant effects for any of the factors (Table 9); feedback yielded an $F =$

Table 8

2-Way Analysis of Variance for Mean Difference Scores

Latency

Source	df	MS	F
Instructions	1	0.2800	0.53
Feedback	1	2.2857	4.30*
Instructions x Feedback	1	0.2057	0.39
Within Cells	24	0.5319	
Total	27		

*p < .05

Epsilon .34

Table 9

2-Way Analysis of Variance for Mean Difference Scores

Fear Thermometer

Source	df	MS	F
Instructions	1	690.0354	2.21
Feedback	1	132.8927	0.43
Instructions x Feedback	1	60.0358	0.19
Within Cells	24	312.4163	
Total	27		

0.43, instructions an F of 2.21 and interaction F = 0.19, all with 1/24 df.

Relationship Between Dependent Variables

A Pearson product-moment correlation coefficient was computed to determine the degree of statistical relationship between the four experimental tasks or dependent variables. A correlational matrix computed over the four sets of difference scores indicated a significant statistical relationship between the rat observation and the rat approach tasks r = .70, t = 2.4, df = 5, $p < .05$ (Table 10). The smallest statistical relationships were found between the self-report fear thermometer and the non-verbal behavioral measures.

Follow-Up

Data were collected in a follow-up testing session conducted two weeks after the conclusion of the experimental sessions. At that time Ss were readministered the fear thermometer, rat approach and rat observation tasks. The data from the rat approach and the rat observation tasks were subjected to data analysis for both feedback and instructions x feedback conditions. One tailed t tests for dependent groups computed over differences between post-experiment and follow-up difference scores for each condition was found to be non-significant for each condition with a t of 1.94 being necessary for significance at .05 level (Table 11). One tailed t tests for dependent groups were

then computed over differences between baseline and follow-up difference scores for each condition. These results, which support the previous ones, were found to be significant ($p<.05$) for each condition (Table 12).

Table 10

Correlation Matrix

		1	2	3	4
Observation	1	-	.02	.70*	.32
Fear Thermometer	2		-	.10	.18
Rat Approach	3			-	.23
Latency	4				-

*p < .05

Table 11

Follow-Up Data

Condition	Post-Experiment	Follow-Up	Difference	t
Rat Observation				
Feedback	54.2	46.8	7.37	.731
Instructions x Feedback	59.2	38.6	20.57	1.84
Rat Approach				
Feedback	5.1	5	.14	.538
Instructions x Feedback	5.1	5	.14	.286

TABLE 12

Follow-Up Data

Condition	Baseline	Follow-Up	Difference	SD	t
Rat Observation					
Feedback	6.9	46.8	39.9	31.5	3.07**
Instructions x Feedback	7.4	38.6	31.2	18.7	3.96**
Rat Approach					
Feedback	4.4	5	.6	.5	2.85**
Instructions x Feedback	4.3	5	.7	.7	2.37*

*p< .05

**p< .01

CHAPTER III

DISCUSSION

As the results demonstrate, hypotheses 1, 3, and 5 were supported while hypotheses 2 and 4 were not supported. All the hypotheses concerned increasing the amount of time spent observing the phobic object (rat observation dependent variable). Hypothesis 1 stated that there would be a significant difference between the feedback group and the control group, hypothesis 3, between the instructions x feedback group and the control group. Hypothesis 5 stated that there would be a significant difference between the instructions x feedback group and the instructions group, hypothesis 2, between instructions and control, and hypothesis 4, between instructions x feedback and feedback.

In the present study the administration of self-monitored feedback brought about a significant increase in the performance of a low probability (phobic) behavior, as predicted by hypothesis 1. Therapeutically oriented instructions failed to produce a change that was significantly greater than that of a control condition, thus failing to support hypothesis 2. The combined condition of therapeutically oriented instructions and self-monitored feed-

back failed to produce results which were significantly different than those produced by the self-monitored feedback condition alone. Thus hypothesis 4 also failed to be supported. So it would seem that in the present study the variable of self-monitored feedback accounted for almost all of the treatment variance. The unusually large epsilon value (.79) obtained for this factor would support this view.

While the principal data analysis and hypotheses testing were carried out on the main dependent variable (rat observation), the analyses of the other behavioral variables also support the present findings.

Both the rat approach and the latency data closely approximate the rat observation data. Both these sets of data, like the rat observation data, yielded significant F ratios for the main effect of self-monitored feedback, while both failed to show significance for either therapeutically oriented instructions, or interaction effects.

The three sets of data are also consistent in terms of the order of the effects. For all three, the greatest increase was observed under the combined condition of therapeutically oriented instructions x self-monitored feedback. This was closely followed by the condition of self-monitored feedback, which was followed by therapeutically

oriented instructions. The mean increase for the control condition for each of the three sets of data was close to 0. These results should not be surprising in view of the fact that the three sets of data were behavioral measures of related low probability responses. The significant correlation between the rat observation and the rat approach data would also reinforce the position that related responses were being recorded.

These supplementary findings support those of the main dependent variable. It would seem that although the administration of self-monitored feedback directly concerned only the rat observational task, the facilitating effect of this variable generalized from a purely observational behavior to an actual approach behavior. These results would indicate that not only can self-monitored feedback significantly increase a target behavior, but also that it is a potent enough variable to generalize its effects to behaviors of different response classes.

The failure to demonstrate any significant effect on the fear thermometer must be interpreted in the light of previous unsuccessful attempts to find a significant relationship between verbal and non-verbal measures of a behavioral phenomena (Baer, Wolf, & Risely, 1968).

It would seem that a S cannot always accurately des-

cribe and evaluate his own behavior. When a S's behavior is modified, it does not necessarily follow that a verbal concomitant of that behavior will also be modified. It is often the case where a S's verbal and non-verbal behavior are discrepant (Bandura, 1969). It would seem that such a case would arise when either his verbal or non-verbal behavior is modified exclusively, so that there would be a change in one and not in the other. The results discussed thus far illustrate this point. In the present investigations, the failure of therapeutically oriented instructions to significantly change behavior may be thought of as a situation in which the manipulation of verbal stimuli and behaviors failed to produce a significant change in non-verbal behaviors.

Conversely, the failure to achieve a significant feedback effect on the fear thermometer appears to be a case in which the manipulation of non-verbal stimuli and behaviors failed to produce a significant change in verbal behaviors. This does not imply that either the verbal or non-verbal behaviors actually represent or express any "true" feelings concerning rats. Neither does it suggest that one of these classes of behavior is "real" while the other is mere performance. Rather it would appear that verbal and non-verbal behaviors are related, but different response classes

which come under the control of different contingencies. Thus verbal behaviors might best be modified by the manipulation of verbal stimuli and behaviors, and non-verbal behaviors might be best modified by the manipulation of non-verbal stimuli and behaviors. An inspection of the fear thermometer data of Table 4 will illustrate this point. While not significant, the order of the effects shows a definite trend. As with non-verbal dependent variables, the combined condition of therapeutically oriented instructions and self-monitored feedback showed the greatest effect. This is followed, not by self-monitored feedback, but by the therapeutically oriented instructions condition. On this task, which measures a change in the S's verbal behavior, a greater effect is shown by the independent variable which manipulates verbal stimuli and behavior, than by the independent variable which manipulates non-verbal stimuli and behavior.

So it would seem that a subjective self-report is not an accurate index of non-verbal behavior. When asked to do so, an individual may attempt to predict or describe his non-verbal behavior verbally. To do so, he may emit verbal responses usually designated as: desires, wishes, or feelings. It is highly unlikely, however, that such verbal behavior will approximate behavior resulting from

actual exposure to reinforcement contingencies. Any prediction or description of a behavior is subject not only to the reinforcement contingencies to which the S is exposed, but is also subject to the contingencies effecting the S's verbal behavior. So any prediction or description of a behavior is a function not only of the behavior being discussed, but also of the verbal contingencies between S and E as well as the verbal history of the S (Skinner, 1966a).

The present investigation has demonstrated that a significant behavioral change may be brought about by the administration of feedback. It has been shown that self-monitored feedback acting alone in the absence of either therapeutically oriented instructions or explicitly programmed reinforcement is sufficient to significantly increase a low probability phobic behavior, (of course, this means that feedback in this situation acted as a reinforcer). It has also been demonstrated that the administration of therapeutically oriented instructions did not significantly affect behavior when administered alone, or facilitate significantly the effects of self-monitored feedback, when administered in combination with feedback. These findings would tend to question the efficacy of instructional variables in changing non-verbal behavior. The results of the present investigation would suggest that in those situations

in which therapeutic instructions have been used in conjunction with a procedure in which the S receives some type of feedback, the instructions functioning as discriminative stimuli, may specify appropriate respondings. However, these stimuli would appear to be relatively ineffective unless there is also behavioral feedback present. This supports the view of Skinner (1957) who maintains that verbal statements which function as discriminative stimuli cannot be effective unless the behavior under investigation has resulted in environmental consequences. The results of the present investigation partially support the suggestion of the Vermont Group (Agras, Leitenberg, & Barlow, 1968; Leitenberg, Agras, Barlow, & Oliveau, 1969; Oliveau, Agras, Leitenberg, Moore, & Wright, 1969) who maintain that both therapeutically oriented instructions and behavioral feedback are crucial variables and may be responsible for the successes of behavior therapies. It would seem that perhaps the importance of therapeutically oriented instructions has been over-valued.

Feedback on the other hand, appears to have demonstrated its effectiveness as a behavioral control variable. What was unexpected about the present findings was the magnitude of change observed under the self-monitored feedback condition, and the durability of the change of this condition as shown by the follow-up data (Tables 11 and 12). It would appear that feedback can function as a posit-

ive reinforcer in the absence of both externally programmed reinforcement and explicitly programmed discriminative stimuli. Apparently, when feedback is directly and explicitly programmed for a behavior, the consequence of that behavior, in terms of its feedback, may be sufficient to change the probability that the behavior will re-occur. If the behavior has resulted in aversive consequences, the resultant feedback may function as a conditioned aversive stimulus and decrease the probability of the behavior's re-occurrence. If the behavior has resulted in positive consequences, the resultant feedback may function as a conditioned reinforcer and increase the probability of the behavior's re-occurrence. Skinner (1953) suggests that the therapist's or educator's chief function may be simply to supply the organism with such feedback.

Since reception of positive reinforcement usually occurs only after some parts of the environment have been effectively manipulated, it follows that the feedback from effective manipulations may come to function as a generalized reinforcer. When this occurs the individual may be reinforced when he receives such feedback, even if no other reinforcement is delivered. In the present study observational behavior resulted in numerical feedback. Longer observational responses resulted in larger feedback scores. These increasingly larger feedback scores may be concept-

ualized as stimuli indicating effective environmental manipulation and as such, as generalized reinforcement. To be effective, reinforcement must be immediate. This requirement of immediacy may be fulfilled by response feedback which becomes established as a conditioned reinforcer. In a sport like target shooting, the result of the shot may not be immediate. The delay between response (shooting the gun) and reinforcement (result from target) is bridged by response feedback from the gun (the kick). Some classes of this feedback are followed by hits and some classes are followed by misses. Stimulus control will eventually occur with certain classes of feedback becoming discriminative stimuli for hits. These stimuli may then function as conditioned reinforcers. In this way straight shooting may be reinforced by "the feel of the shot". In the present study, some classes of observational responses led to large feedback scores, and some led to small scores. It is suggested that since longer observational responses led to larger scores, this class of responses was shaped up and maintained, in a manner not unlike the process of successive approximation.

The present findings would seem to have obvious implications for behavior modification, the most important of which would concern the maximum employment of behavioral feedback.

Since it has been shown that feedback can lead to significant behavioral change it would logically follow that the apparent potency of this variable should be fully exploited whenever possible. This might entail making behavioral feedback more observable by having Ss record their own target behaviors, by Es consistently reinforcing self-observational responses, and by the use of electronic equipment as used in heart rate variability studies (Hnatiow & Lang, 1965).

The exploitation of feedback as a behavioral control variable may be facilitated in a therapeutic atmosphere, when in addition to dispensing social reinforcement the therapist also indicates to the patient the behaviors on which the reinforcement is contingent. Indeed, the therapist may discover that the patient will become less and less dependent upon him and may begin to play a larger role in his own treatment. This is currently the case in the field of self-control (Kanfer, 1967) in which the patient in effect functions as his own therapist. It should be noted that in the area of self-control the employment of self-monitoring, (actually using behavioral feedback as treatment), is a principal feature (Kanfer, 1967).

In regard to self-control, the present findings may present an instance in which the effect upon behavior of

self-monitored feedback may be evaluated in an unconfounded manner. It is an instance in which feedback has been manipulated in the absence of both therapeutic instructions and programmed reinforcement. It is a case in which an observable event was used as a dependent variable instead of the usual self-report. The present study would indicate that self-monitoring and self-control are legitimate areas of inquiry, amenable to direct assessment, intervention, and evaluation.

It has been suggested that the graduated behavior therapies such as operant shaping and systematic desensitization, may be typified by the presence of feedback available. This feedback may take the form of an advance in an anxiety hierarchy or the reception of social reinforcement (Agras, Leitenberg, & Barlow, 1968). In view of the results of the present investigation it would seem appropriate to ask what, if any,additional behavioral variables are used in these therapies. What else does systematic desensitization (Wolpe, 1958) do for the patient than present him in some manner with a phobic object in a gradually increasing anxiety hierarchy and give him feedback of his behavior whenever the therapist proceeds up the hierarchy? If feedback is the crucial behavioral variable, and not relaxation (Wolpin & Raines, 1966) or reciprocal inhibition

(Lomont, 1965) then it should be more fully explored. The present findings suggest implications for further research in the employment of the observational methodology, both as experimental methodology and as a therapeutic tool.

As experimental methodology, the use of an observational response as a dependent variable would seem to be preferable to an approach response, in examining phobic behaviors. Several parameters of this type of response might be examined. In the present study, it was observed that the force that the S used to pull the viewing handle down, appeared to be related to his performance on the previous trial. This phenomena might be interesting to examine. Another variable which might be examined is the relationship of the behavior of the phobic stimulus to the behavior of the S. In the present investigation the behavior of the rat was consistent from S to S as a result of placing him on an FR20 reinforcement schedule. This was done because it was noticed during early preliminary work that the Ss reacted to the rat more strongly when it was moving than when it was stationary. In most phobia studies this variable is usually not controlled, and might contribute to within-subjects variability.

As a therapeutic tool, the observational methodology

might find a use with highly phobic Ss who normally would find approaching and touching a phobic stimulus too aversive to participate in deconditioning procedures. The present investigation dealt with highly phobic Ss who found just viewing a rat highly aversive. This type of individual would not be amenable to a type of therapy in which she was asked to actually physically encounter the phobic object. By having the S view the phobic object under feedback conditions, she was better able to approach it. Employed in this way, the observation methodology might be useful as the initial steps in a treatment hierarchy.

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APPENDIX A

Preliminary Experiments

EXPERIMENT I

METHOD

Subjects

The Ss were 15 female undergraduate students at the University of Manitoba who achieved a score of 50% or more on a rat fear index (Rutner, 1970) which was administered to introductory psychology students. All Ss received experimental credit for participating in the experiment.

Apparatus

The apparatus for the preliminary experiments was essentially the same as that used in the main experiment.

Procedure

As in the main experiment, Ss were given preliminary testing consisting of the Wolpe and Lazarus (1966) fear thermometer, rat approach task, and five preliminary trials of the rat observation task. The instructions to the S for the rat observation task were to view the rat for as long as she could.

Preliminary Trials

At the conclusion of the five preliminary trials Ss were divided into high phobic and low phobic groups. Subjects who scored 5 points or less on the rat approach task,

and who also exposed themselves to the rat for less than 30 seconds on each of the five preliminary trials of the rat observation task, met the behavioral phobic criteria and were placed in the high phobic group. Subjects who scored 6 points or more on the rat approach task, and who also exposed themselves to the rat for 30 seconds or more on any of the five preliminary trials of the rat observation task, exceeded the behavioral phobic criteria and were placed in the low phobic group.

Experimental Trials

At this time Ss in both groups were individually run. Twenty experimental trials were conducted and recorded. As in the preliminary trials, there was a 15 second rest period between trials. Any trial in which the S failed to depress the handle within five seconds of the sounding of the buzzer was to be scored 0, but this never occurred. Any response which reached 90 seconds in duration was scored as 90 seconds, and the trial was terminated at 90 seconds.

RESULTS AND DISCUSSION

Figure 3 illustrates the mean observation response durations for the low phobic and high phobic groups. An inspection of Figure 3 reveals the large mean response differences between the two groups. For the five Ss who

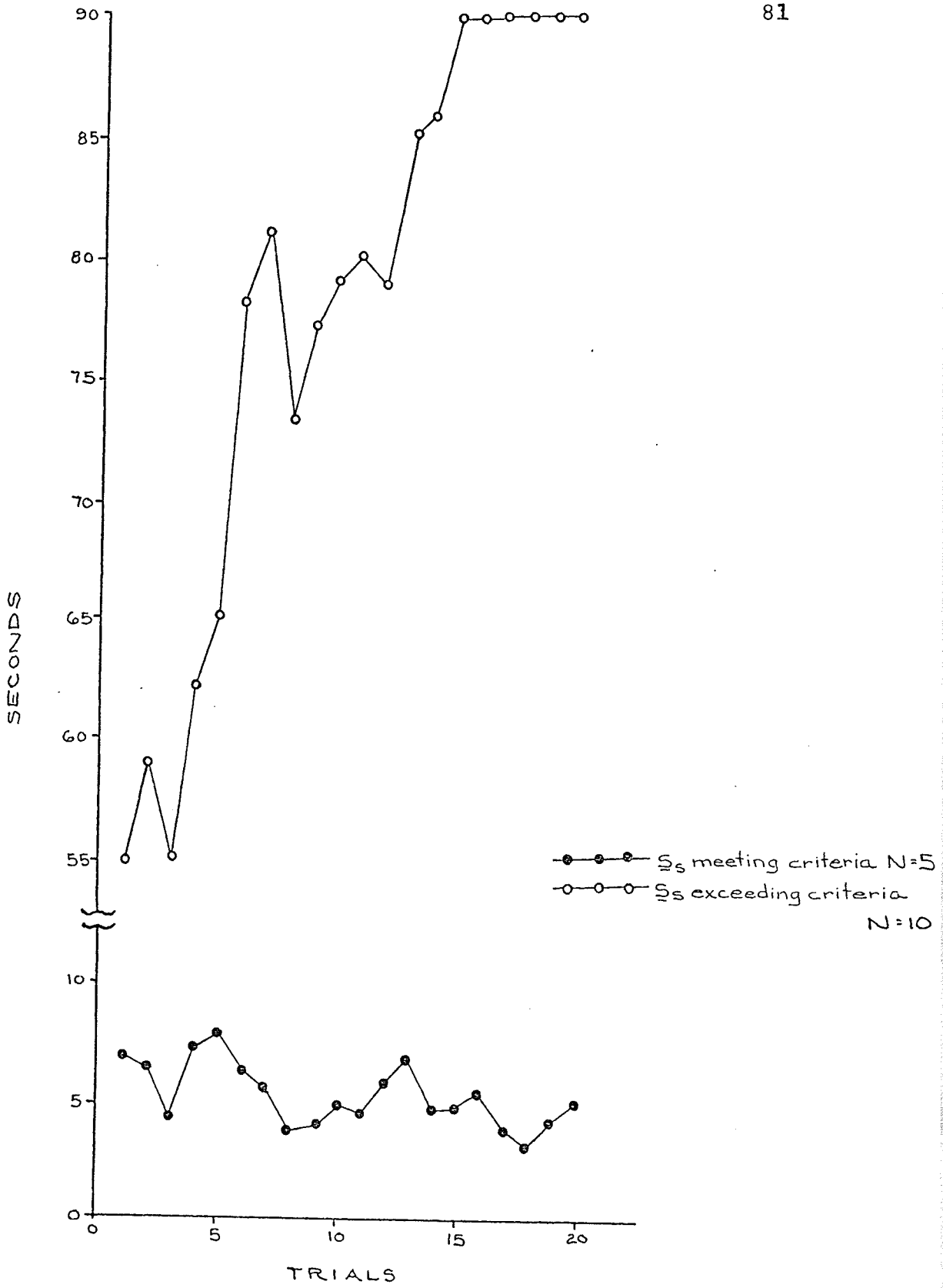

Figure 3. Mean observation response durations for low and high phobic groups.

met with behavioral phobic criteria and were thus considered highly phobic there was a decrease from a mean of 6.5 seconds on trial one to 4.5 seconds on trial twenty. For the ten Ss who exceeded the behavioral phobic criteria and were thus considered low phobic there was an increase from a mean of 55 seconds on trial one to 90 seconds on trial twenty. It would appear that the behavior of the Ss exceeding the behavioral phobic criteria was typified by relatively large and increasing response durations. Thus, the Ss meeting the behavioral phobic criteria appeared to be exhibiting fairly stable response durations. So it would seem that the phobic observational methodology discriminates between high and low phobics not only with regard to the actual duration of responses, but also in the directionality of these durations.

EXPERIMENT II

METHOD

Subjects

The Ss were 6 female undergraduate students at the University of Manitoba who achieved a score of 50% or more on a rat fear index (Rutner, 1970) which was administered to introductory psychology students. All Ss received ex-

perimental credit for participating in the experiment, and none had participated in Experiment I.

Apparatus

The apparatus for Experiment II was the same as used in Experiment I except for a slight modification in the viewing mask. At this time a 1" x 2" piece was cut out of the right side of the mask. In this way the right eye of the S was clearly observable to the E during the observational responses. This modification made it possible for the E to discover if the Ss were complying with instructions to keep their eyes open during the observational response.

Procedure

As in Experiment I, Ss were given preliminary testing consisting of the Wolpe and Lazarus (1966) fear thermometer, rat approach task, and five preliminary trials of the rat observation task. The only difference being that the instructions for the rat observation task were modified. Instead of being told to view the rat for as long as she could as in Experiment I, the new instructions called for the S to keep viewing the rat until her arm got tired holding the viewing handle down.

At the conclusion of the five preliminary trials, Ss who scored 6 points or more on the rat approach task, and

who exposed themselves to the rat for 30 seconds or more on any of the five preliminary trials of the rat observation task, were dismissed from the study. Subjects who met the behavioral criteria of scoring 5 points or less on the rat approach task and who also exposed themselves to the rat for less than 30 seconds on each of the five preliminary trials of the rat observation task, were included in the study.

Experimental Trials (Session 1)

As in Experiment I, Ss were tested individually, with trials being conducted and recorded. As in the preliminary trials, there was a 15 second rest period between trials. Any trial in which the S failed to depress the handle within five seconds of the sounding of the buzzer was to be scored 0, but this never occurred. Any response which reached 90 seconds in duration was scored as 90 seconds, and the trial was terminated at 90 seconds.

Follow-Up (Session 2)

Two weeks after the conclusion of Session 1, the six Ss were contacted and asked to report for further testing. Four out of the six responded, with Ss designated S1 and S2 refusing to participate. Upon questioning,these Ss indicated that they found the experiment too aversive to subject themselves to it again.

Session 2 was a direct replication of Session 1, with the apparatus and procedure used being the same as in Session 1.

RESULTS AND DISCUSSION

Figures 4 and 5 illustrate the individual observational responses for the six Ss who met the behavioral phobic criteria and were thus included in the study. For Ss 3-6 individual response durations for both Sessions 1 and 2 are illustrated together so that they may be directly compared. An inspection of Figures 4 and 5 reveals relatively stable observational response durations for various numbers of trials. With the exception of S3, the response patterns appear to be fairly uniform and in a downward direction. It would appear that an increase in the number of trials leads to a more stable response pattern as indicated by Ss 1, 4, and 6. The pattern of response appears to be similar to those of the high phobic group of Experiment I. The only difference seems to be in regard to the duration of responses, with the durations observed in Experiment II being somewhat smaller. Perhaps this was a function of the change in instructions. No Ss were observed to close their eyes during the observation responses. Thus it would appear that the phobic observational methodology produces stable response durations,

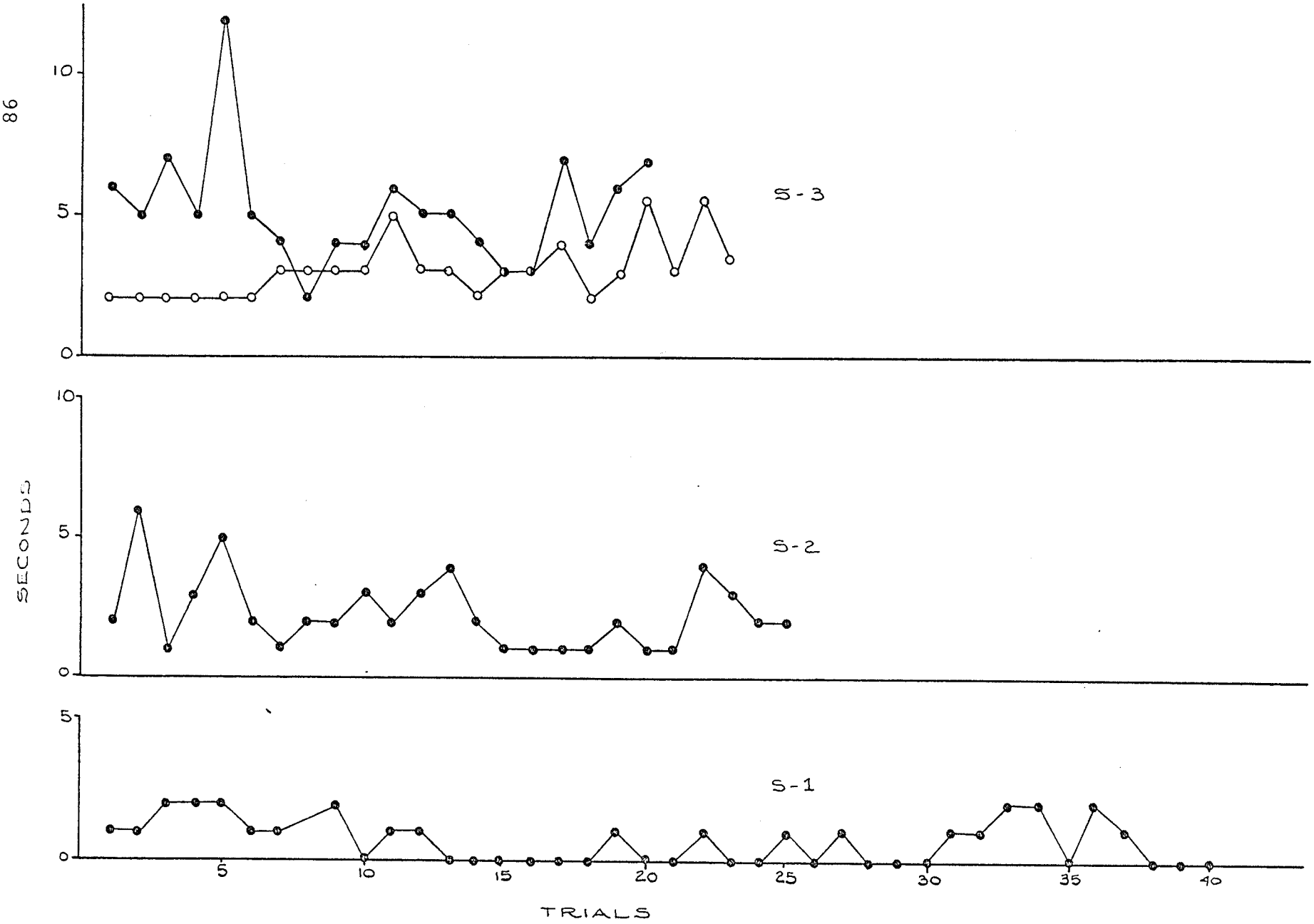

Figure 4. Individual response durations for phobic subjects, 1 - 3, across trials.

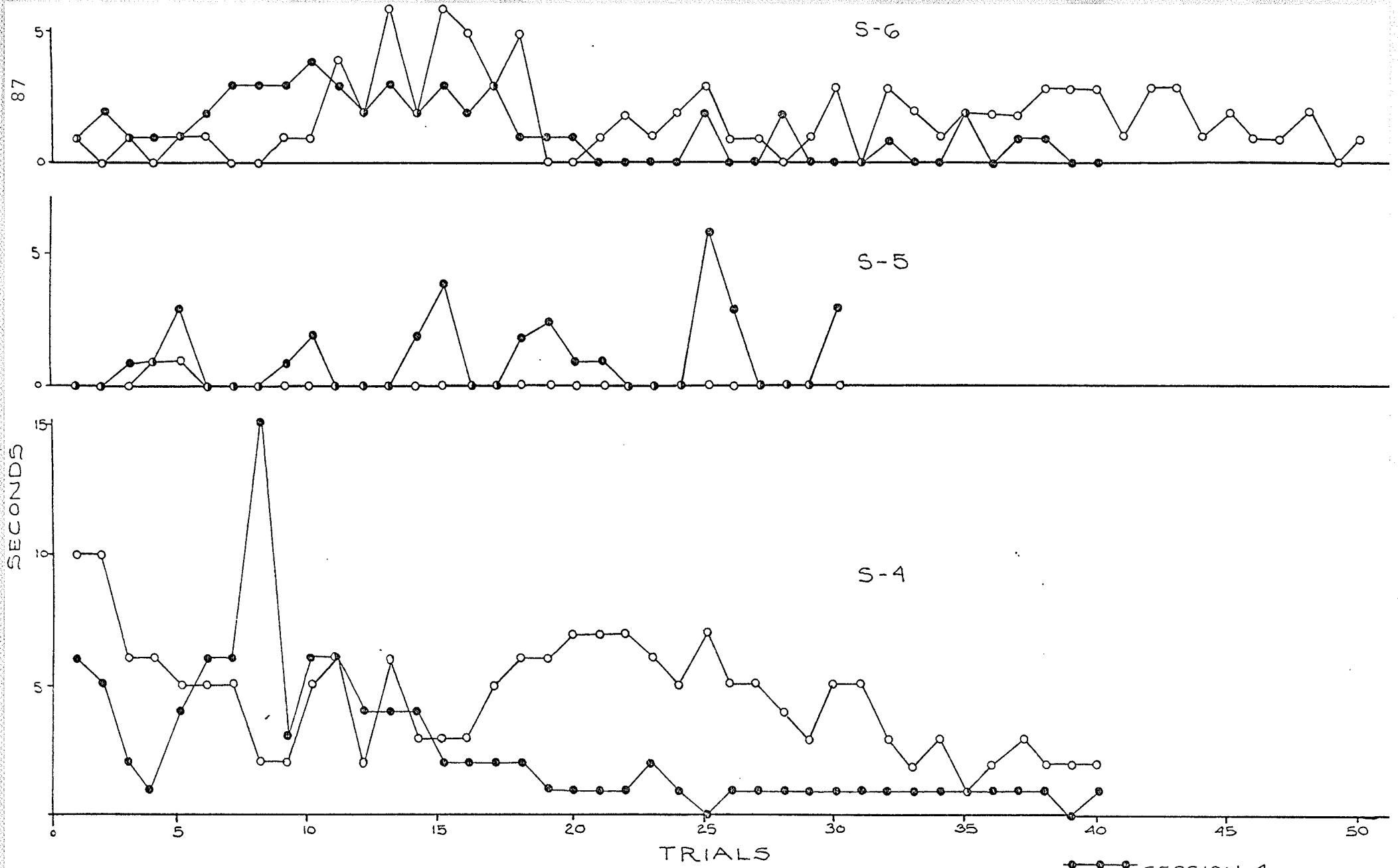

Figure 5. Individual response durations for phobic subjects, 4 - 6, across trials.

which become relatively more stable with an increase in the number of trials. A further inspection of Figures 4 and 5 indicates the similarity of the data from Sessions 1 and 2. It would appear that for Ss 3, 4, and 6 the data of Session 2 is consistent with the data of Session 1. The response durations of S5 appear to have become more stable. So it would seem that the phobic observational methodology produces response durations which are reliable over time. Subjects exhibiting phobic behavior at one session appear to exhibit similar behavior at a later session.

The results of these two experiments indicate that the phobic observational methodology successfully discriminates between high and low phobic Ss. The response durations produced by the methodology were stable both within and across sessions. The stable response durations obtained with the methodology appear to be such that they might be fruitfully used as a behavioral baseline in an investigation of phobic behavior. The advantage of such an investigation over present methods (Leitenberg, Agras, Barlow, & Oliveau, 1969), would be that phobic behavior may then be studied as an on-going temporal phenomenon not unlike other operant behaviors. In this way individual phobic behavior may be kept under observation for long periods

of time and the variables of which it is a function could be effectively manipulated against a stable on-going behavioral baseline.

APPENDIX B

TESTS

FEAR THERMOMETER

0	10	20	30	40	50	60	70	80	90	100

Consider the above figure as an index of your fear or anxiety concerning rats and circle the appropriate rating. If, for example, you feel completely relaxed and at ease, circle "0". If, on the other hand, you feel extremely uneasy or anxious about rats, circle "100". If you would place yourself somewhere between these two extremes, indicate this by circling the appropriate rating.

RAT FEAR INDEX

It is quite normal and indeed usual for individuals to find certain objects and events frightening, such as heights, enclosed places, animals, etc. We are interested in gathering data concerning the fears of people in regard to rats and snakes.

1. In a laboratory situation in which you are asked to observe and possibly touch a "tame" rat, would you be:

_____	0 not at all fearful	
_____	1 slightly fearful	
_____	2 moderately fearful	CHECK APPROPRIATE
_____	3 quite fearful	STATEMENT
_____	4 extremely fearful	

2. In a laboratory situation in which you are asked to observe and possibly touch a harmless snake, would you be:

_____	0 not at all fearful	
_____	1 slightly fearful	
_____	2 moderately fearful	CHECK APPROPRIATE
_____	3 quite fearful	STATEMENT
_____	4 extremely fearful	