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THE EFFECTS OF VARYING COVERT REINFORCEMENT AND COVERT BEHAVIOR REHEARSAL INSTRUCTIONS ON FRIENDLY ASSERTIVE BEHAVIOR: AN AUTOMATED SELF-CONTROL PROCEDURE

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PREFACE

The author has attempted to present a general discussion of some of the important theoretical aspects related to self-control behavior phenomena. Some of these discussions are not directly related to the central experimental topic. However, they help delineate a framework within which to view the more specific topic of interest here. That more specific type of self-control behavior of main interest in the paper is self-reinforcement—especially covert self-reinforcement. The author thinks that this is an exciting area and would like to see the experimental rigor that has characterized better research on overt behavior brought to the area of covert behavior on a larger scale. The methodological problems are great. Some prefer to simply wait until covert behavior can be directly observed before studying it. However, much can be learned earlier, and research results seem to support this assertion.

This investigator is also particularly interested in developing applied methods of self-control—especially simplified or automated methods. One advantage of refining and specifying these methods (if they work) is that they can then easily be used and studied by both professionals and laymen in a large variety of settings. Desensitization has been the first successful example of a method that has been clearly specified which seems to be widely applicable to all sorts of problems.

The experiment is a test of an automated method for increasing friendly assertive behaviors. From this first crude attempt, it is

hoped more can be learned. Work in automated behavior change techniques is only beginning. It may hold in the future a way for many people to develop effective means for changing their own behavior.

ABSTRACT

A discussion of the applicability of conditioning principles to self-control behavior was presented and relevant research was reviewed. This discussion included both overt self-control behavior and covert self-control behavior emphasizing the instrumental (or operant) conditioning principle. Some of the problems associated with studying covert behavior were discussed. It was concluded that valuable research can be obtained from studying covert behavior as an intervening variable. In addition there is reason to believe that it may be useful to take conditioning principles which have been well-tested on overt behavior and apply them to covert behavior.

An experiment was devised to test the effects of covert reinforcement and covert behavior rehearsal. There were three treatment groups—balanced for sex, social anxiety test scores, and school attended. Each group had 12 pairs of Ss. The first group was the Covert Rehearsal-Reinforcement Outcome (CRR) group, the second group was the Covert Rehearsal-Neutral Outcome (CRN) group, and the third was the Placebo (P) group. Each pair of Ss was taken to a testing room and given a set of pretest questionnaires. Then they were taken to a training room where they listened to a prerecorded tape lasting about 40 minutes. Then they were taken back to the testing room and asked to complete an additional set of questionnaires. During both testing sessions a hidden tape recording of their conversation was made. The entire experiment lasted approximately 90 minutes. The only difference in treatment for the three groups was in the pre-

recorded tape. The CRR tape contained instructions to imagine a series of eight scenes. In each scene each S was asked to imagine himself in a particular social setting, imagine himself initiating a conversation with the person imagined in the scene, and imagine the other person's very friendly response. The CRN tape was identical except that the Ss were asked to imagine less positive replies by the other person. The P tape consisted of a short lecture on Freudian psychology then Ss were asked to think about some questions applying the concepts to their life. All Ss were told that the treatment was to help them become more friendly and outgoing.

There were overall treatment effects on Eysenck's PEN Extraversion scale, on a specially designed Friendly Assertive Expectations questionnaire, and on change in the percentage of time Ss talked to each other during the testing sessions. Further analysis showed rather consistently across measures that the CRR and CRN group means did not differ significantly, but that the pooled CRR-CRN group means were significantly greater than the P group means.

Some of the possible limitations of the study were discussed. However, it was concluded that the evidence supports the hypothesis that covert rehearsal can have effects upon specific expectations and actual overt behavior. The hypothesis concerning the additional effect of higher values of covert reinforcement was not supported. It was also suggested that in a number of situations covert techniques and automated techniques may have advantages over other techniques.

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CHAPTER I

SELF-CONTROL BEHAVIOR

Slaving over a typewriter to prepare a manuscript, counting to ten while being insulted, resisting the temptation to cheat on an exam, pushing away a fattening piece of pie, imagining what the new room will look like while working long hours on it, and telling oneself that smoking is bad for your health are all examples of self-control behavior.

Psychologists of different theoretical persuasions have been interested in self-control behavior for many years. Ego strength, internal control, independence, character strength, resistence to temptation, sacrifice, delay of gratification, and other such terms have been used to describe this kind of behavior. Often these terms remained vague. These terms frequently did not describe the specific types of responses that were supposed to represent examples of self-control behavior. Also they did not adequately analyze the antecedent conditions which establish or strengthen self-control behavior or the efficacy of self-control behavior in actually controlling other behavior.

This introduction to the experiment to be described later is an attempt to discuss theoretical aspects of self-control behavior and relate some relevant research findings to the discussion. The paper gradually moves from a more general, less detailed discussion of self-control behavior to a more detailed discussion of self-reinforcement and covert self-reinforcement phenomena. The more general topics are

discussed to provide a theoretical framework with supportive research within which to relate the concepts of self-reinforcement and covert self-reinforcement. Self-reinforcement and especially covert self-reinforcement have not been adequately researched yet.

The first chapter contains a very general discussion of self-control behavior and some dimensions for analyzing self-control behavior from a conditioning point of view. The second chapter presents a general discussion of self-instrumental conditioning and expands the discussion on self-reinforcement and conditioned reinforcement. (Self-reinforcement is viewed as a type of conditioned reinforcement.) The third chapter is concerned with covert conditioning phenomena. Methodological problems in studying covert behavior are discussed along with a brief summary of some of the types of research that have found the intervening variable of covert behavior to be useful. In addition there is a more detailed discussion of studies utilizing the covert reinforcement paradigm. Chapter four includes more specific statements of problems assumptions, and hypotheses related to the experiment. Chapter's five, six, and seven present the method, the results, and the discussion of the experiment.

The Self-Control (or Controlling) Response and the Controlled Response

A number of recent distinctions have been made which help to analyze self-control situations more clearly. Skinner (1953) made an important distinction between the controlling response (or self-control response) and the controlled response. The controlling response is any response which "affects variables in such a way as to change the pro-

bability of the other." The controlled response is the response which is changed. He sees the process as somewhat analogous to an interpersonal situation where one person's behavior affects another person's. Skinner procedes to give some different examples of types of controlling responses. His types include making changes in the physical environment such as a child sealing his own lips with adhesive tape to prevent talking; changing the discriminative stimulus, such as closing the door to eliminate distracting noises; increasing one's own deprivation or satiation; manipulating emotional conditions, such as going away so one can relax or telling oneself a joke; using aversive stimulation, such as setting an alarm clock; the use of drugs; self-reinforcement, such as going out only after doing one's work; self-punishment; and doing something else which is incompatible with the behavior.

A number of important distinctions between different self-control responses can be made. The dimensions presented here may make it easier to analyze self-control behavior utilizing already fairly well-known concepts and learning principles. Staats (1963) has emphasized the importance of analyzing complex forms of human behavior using already well-understood principles. He suggests carrying out detailed theoretical S-R analyses during the discovery (pre-experimental) phase of research in order to generate new hypotheses for testing these extensions of learning principles to complex human behavior. This is the method that this author will use. Several general dimensions for describing self-control behavior will be presented.

The first is the degree to which the self-control response is related to more organized self-control response systems. The second

distinction is the availability of controlling stimuli to the subject. The third is whether or not the self-control response has its effect mediated by the environment. The fourth dimension is whether the self-control response is overt or covert, and the fifth is whether it is conditioning other responses according to the classical or instrumental conditioning paradigm.

Relation of the Response to Specialized Self-Control Response Systems

An important theoretical distinction may prove to be the degree to which controlling other responses is a primary function of the self-control response, or the degree to which it is part of a specialized self-control response system. These same response systems may also function to change the behavior of other persons in a way analogous to how they change one's own behavior. For example one may tell himself to stop talking with the result that he stops talking or he can tell someone else to stop talking with a similar result.

A number of authors have hypothesized the existence of response systems which function primarily as self-control responses. For example Skinner (1953, 1957) mentions a number of possible specialized self-control responses. One is the autoclitic response. These are verbal responses with a primary function of controlling other responses. Examples include self-editing of statements, stating contingencies such as "If it rains, we won't go", etc.

Staats (1963, 1968, 1971) has elaborated a number of such theoretical response systems or "behavior repertoires." Several of these have as an important function the control of one's own behavior. For example a generalized imitation response may have the primary effect of

increasing the probability that a person will learn a new specific skill. Another example (Staats, 1963, p.181) is the language repertoire consisting of instructions such as "open your eye", "extend your tongue," "put your right foot forward," etc. Special response systems which can elicit other responses symbolizing possible consequences of behavior may also be important. These symbolic responses may be verbal or image responses. A person's image of what will happen may have important controlling effects on other responses.

Premack (1970) makes a distinction between a decision to change one's behavior which leads to self-instruction responses and an "internal contingency". The former acts as an organized response system which has been developed to control one's own behavior through self-instruction in the specific situations where the behavior occurs. These self-instructions are assumed to begin as the result of a decision. For example following a decision to quit smoking a person tempted to smoke may tell himself to "put it down". There is less specialization in an "internal contingency" in which the controlled response may simply happen to be followed by a response of high reinforcement value which then increases the probability of the first response. For example the image of dying of cancer following a smoking response may decrease the probability of smoking. That is an internal contingency. The response system including the verbal response "think of the cancer image each time you smoke" is part of a more specialized self-control system.

Other authors have also described self-control skills. Goldiamond (1965) suggests giving subjects specific training in behavior modifi-

cation techniques. The special behavior change skills that result can then presumably help the person gain more control over his own behavior. More recently Watson and Tharp (1972) have written a text book which can serve as a guide for "Self-Modification" projects. The instructions in the book can be learned so that they can later become self-instructions when one desires to change some habit.

Availability of Controlling Stimuli ("Freedom of Choice") as Necessary for Self-Control

It has usually been assumed that a necessary part of any definition of self-control is that the person have the possibility of presenting the relevant controlling stimulus to himself. Skinner in discussing this point relevant to self-reinforcement says:

> Self-reinforcement of operant behavior presupposes that the individual has it in his power to obtain reinforcement but does not do so until a particular response has been emitted. This might be the case if a man denied himself all social contacts until he finished a particular job. Something of this sort unquestionably happens, but is it operant reinforcement? It is certainly parallel to the procedure in conditioning the behavior of another person. But it must be remembered that the individual may at any moment drop the work in hand and obtain the reinforcement. We have to account for his not doing so (1953, p.238).

This author basically agrees with Skinner on this point. However, Skinner seems reluctant to hypothesize about the answer to his question about why the person does not go ahead and obtain the immediately available reinforcement. This author hypothesizes that one reason that self-conditioning can occur is that self-control response systems intervene. These self-control response systems may provide the immediate stimuli necessary to maintain (or withhold) some response in the face of other immediately available stimuli which would tend to elicit some other

response. The self-control systems are themselves reinforced by more delayed consequences. Thus the man in Skinner's example might for instance tell himself that "If I get my work done regularly, I will get a promotion. I know the promotion alone won't be enough incentive for me to do all my work. However, I can keep a promise to myself. I will make a contract with myself of no social contacts until my work is done each day." When a days work arrives, it is the Sd for the order to oneself, "Do not socialize until my work is done." To the extent that these kinds of verbal self-instructions have been reinforced in the past they will control his behavior. If the promotion is obtained in the long run, then that will reinforce future self-control behavior. The diagram below illustrates this example in detail.

<u>Previous Conditioning of Generalized Habit</u>:

Sd	self-control R	Sr
temptation situation	make contract with self and keep it	delayed reinforcement obtained

<u>Generalized Habit</u>:

Sd	self-control R	delayed Sr
temptation situation: Friends available to talk to but need to work.	make contract to wait until work done and give self-command ↓	(promotion, etc.)

Specific Self-Control Response:	Sd'	R'	Sr
	self-instruction "keep contract"	work until finished without visiting	(1) visit friends (2) work done

It is this author's contention that self-control response systems are necessarily related to self-control behavior, and that self-control behavior cannot be completely understood without analysis and testing

of these learned response systems. It is also contended that these systems are learned by the same principles other behaviors are.

Environment Mediated and Nonmediated Self-Control Responses

Self-control responses can act directly on other responses or their effects on other responses can be mediated by their effects on the environment. One of this author's students did a project in which he pinched himself whenever he caught himself biting on his fingernails. He decreased the frequency of his nail biting. Another student who worked in a complaint department imagined customers' "blowing their minds" whenever he was able to remain calm and smile even in the face of harrassment. This decreased his covert cussing and losing his temper. These are examples of how one self-control response may more directly influence the probability of other responses with less environmental mediation.

Skinner (1953); Ferster, Numberger, and Levitt (1962); and others have suggested a number of self-control techniques in which the self-control response has effects on the environment setting in motion events which will later affect the person. They provide many examples. One may deprive himself or satiate himself on a reinforcer so that it will have more effect later. For instance he might drink a quart of water before going to a cocktail party so he will not drink so much. One might avoid stimuli with a high probability of eliciting undesireable responses or approach those with a high probability of eliciting desireable responses. For example a person on a diet might stop buying sweets so they will not be in the house when he is hungry. A person trying to stop smoking might spend more time with nonsmokers.

Another method of self-control by environmental mediation is to establish external contingencies for oneself. For example one teacher successfully stopped his habit of saying a useless phase by having his class of 200 students shout the phrase back at him whenever he said it. More elaborate procedures may utilize a formal contract between the subject and others. Taking drugs is another way people manipulate their environment to cause changes in their behavior.

Overt and Covert Self-Control Responses

Another important dimension for describing self-control behavior is whether the behavior is overt or covert. The self-control response may be overt or covert and the controlled response may be overt or covert. Each of these different combinations has its own set of methodological problems. Some of these will be discussed later.

Self-Classical and Self-Instrumental Conditioning

Another convenient distinction in analyzing self-control behavior may be the difference in training procedures. One could use either a self-classical conditioning or a self-instrumental conditioning procedure. In a self-classical conditioning procedure the self-control response would be the response controlling the presentation of the conditioned stimulus (CS) and unconditioned (UCS) or previously conditioned stimulus. In this paper the word unconditioned stimulus will mean either not conditioned or previously conditioned before this training period. The word conditioned stimulus will refer to stimuli being conditioned in the immediate training procedure. The self-control response may be either the CS, UCS, or both. The self-control response may be the CS, which is presented prior to or during the time

the UCS occurs naturally. The controlled response is the CR which then comes to be elicited by the CS. For example a person may want the word "love" to have more emotional meaning for him. He could do this by saying the word to himself (CS) whenever he is in a situation (UCS) eliciting warm feelings (UCR). Then the word "love" (CS) would come to elicit more warm feelings (CR).

A second method of self-classical conditioning is for the self-control response to control presentation of the UCS contingent upon the natural occurance of the CS. For example one might label as bad (UCS) his own behavior of yelling at others (CS). After awhile that behavior may come to elicit a negative emotional response (CR) on its own without the labeling response intervening. Staats (1968) has previously discussed these possibilities.

A third method of self-classical conditioning involves self-control of both the UCS and CS presentation. A self-desensitization procedure would be an example. Phillips, Johnson, and Geyer (1972) utilized a self-desensitization procedure in which the self-control response was turning on a prerecorded tape and following the imagery instructions. One could also have more control over presentation of the UCS and CS. If he were afraid of water, he could practice relaxation instructions until the word "relax" (UCS) had some power to elicit relaxation (UCR). Then while at the beach he could gradually approach water (CS) while telling himself to relax. In this way he would be controlling the presentation of both the UCS and the CS.

Also it may eventually be possible to analyze some forms of standard desensitization procedures from a self-classical conditioning

model. Because even though the instructions are not self-administered, any immediate effective image stimulus would be. However, methodological problems arise which will be discussed below. It is also possible that other models are more appropriate than the classical conditioning one anyway, but at present this is unclear. For review of the desensitization literature see Bandura, 1969; Paul, 1969; Jacobs and Wolpin, 1971; Lang, 1969; and Wilkins, 1971.

The efficacy of classical conditioning procedures seems well established for conditioning many "involuntary" responses (cf. Kimble, 1961). This has been done using an extremely wide range of stimuli including words (cf. Staats, 1963, 1968) and imagery instructions (cf. desensitization literature). Staats (1971) has commented on the potential utility of classical conditioning in a behavior language therapy for changing emotional behavior, attitudes, and reinforcement value. He has included self-control procedures in his discussion.

Self-instrumental conditioning procedures will be discussed in a separate chapter later.

Practical Importance of Self-Control Behavior

There are many advantages of developing self-control responses in individuals. First there are many situations in which behavior that is important to society cannot be immediately monitored or reinforced. Often the monitoring is poor and the external reinforcement weak or delayed. Under these and other circumstances where immediate external stimuli have only weak controlling effects on the desired behavior, it seems that self-control responses can be very useful from the point of view of the society that desires the behavior. Self-control responses

may also be very desireable to the individual who desires some delayed reinforcement, but who would not make the necessary responses to get it without the mediation of self-control behavior.

The behavior change interview situation is one in which methods leading to increased self-control may be very helpful. For example a number of authors have expressed doubt that any behavior change which might occur in a psychotherapy interview will generalize beyond the interview situation into the target person's natural environment. Ordinarily the interviewer does not manipulate important conditions in the target person's environment which may be important in controlling the desired behavior. There is the possibility that using techniques which increase self-control behavior will help the target learn to manipulate some of these external environmental and internal environmental variables which control his immediate behavior outside the interview room. A number of behavior modification techniques which might be classified as self-control techniques have already been developed and used in clinical settings with some success. Some brief reviews of these techniques include those by Kanfer and Phillips (1970, pp.426-440) and Cautela (1969). Some of these applications of self-control techniques will also be discussed further below.

Of course there are disadvantages to using self-control techniques. To use a self-control technique which presumes a certain level of self-control skill already may be very appropriate if the person has the required skill, but inappropriate for someone without that level of skill (or "maturity"). Also, one cannot neglect the importance of external contingencies even in persons with the highest degrees of self-

control. It is a constant emphasis that even in these cases, some sort of reinforcement—even if greatly delayed—must occur occasionally to maintain the self-control. It is assumed that a person's behavior cannot become completely autonomous from his overall psychological environment.

CHAPTER II

SELF-INSTRUMENTAL CONDITIONING

In calling certain behavioral phenomena self-instrumental conditioning it is assumed that the process is isomorphic to standard instrumental conditioning phenomena. In other words the same principles apply to both phenomena. A classical example of standard instrumental conditioning by Skinner and associates would be reinforcing a pigeon with a food pellet whenever he pecks a disk in the presence of a white disk. The probability that the pigeon will peck the disk when it is white increases. If he is not reinforced for pecking a black disk, he will peck the white disk at a much higher rate. The discriminative stimulus (Sd)—the white key—is the stimulus which precedes the response and is correlated with the occurrence of the reinforcing stimulus. It comes to elicit or "control" the response. The response (R) is the peck. The reinforcing stimulus (Sr)—the food pellet—is a stimulus which under certain conditions tends to increase the probability that the Sd will elicit the R (cf. Premack, 1965).

<u>Instrumental Conditioning Paradigm</u>:

Sd ————————	R ————————	Sr
(white key)	(peck)	(food pellet)
So ————————	R ————————	no Sr given
(black key)	(peck)	

This analysis of instrumental conditioning has stressed the effect of the reinforcer in strengthening the relationship between the response and some correlated initial conditions, not in a simple indiscriminate

increase in the probability of responses. A great body of literature exists on some of the variables which affect the strength of instrumental conditioning (cf. Ferster & Skinner, 1957; Honig, 1966; Kimble, 1961; Premack, 1965).

If the concept of self-instrumental conditioning is to be useful and not be a misnomer, then (1) stimuli and responses must be identified which correspond to acceptable notions of Sd, R, and Sr, and (2) the same variables which have been shown to affect standard instrumental conditioning must be shown to affect self-instrumental conditioning in a similar way. Finally, if the prefix "self" is to be retained, it must be shown that there is a difference between phenomena described with the prefix "self" and "non-self" instrumental conditioning phenomena.

Two points need to be stressed. First, it is not necessary that the self-instrumental conditioning phenomenon have its own set of principles. If it did—as mentioned above—it would not be isomorphic to the standard kind and the notion of self-instrumental conditioning would be a misnomer. Bandura (1969, 1971) often seems to assume that "self" and "vicarious" prefixed phenomena cannot be explained by standard principles. This seems inconsistent with the reasoning presented here. On the other hand Gewirtz (1971) seems to diminish the importance of the self-prefixed phenomenon on the grounds that traditional principles can explain it. He seems to think the concept does not really offer anything new. Again, while it is assumed by Gewirtz and this author that traditional learning principles can be used to explain self-prefixed phenomena, that takes nothing from the importance

of the concept. Within the general concept of instrumental conditioning the self—non-self conditioning distinction may be considered to be a subordinate distinction of some importance. There may be very different consequences stemming from whether conditioning is self or other initiated. Without this distinction the cause of the difference would remain a mystery. For example, it may be that self-initiated conditioning is more resistent to extinction or may need less monitoring by outside observers in some situations.

The term self-instrumental conditioning may be used to describe self-initiation of either the Sd or the Sr or both. The following sections will discuss some of the implications of these three possibilities of self-instrumental conditioning.

The Self-Discrimination Function of Self-Control Responses

Self-discriminative responses (self Sd) are responses that either produce or serve as Sd for other responses. Thus they are a type of self-control response. Examples of environmentally mediated self Sd responses would include hanging a shopping list on the bathroom mirror, setting the alarm clock, reading a book of instructions, or asking a friend to give you advice. Examples of direct self-Sd responses include telling oneself how to swing his tennis racket from memorized or original instructions, imagining oneself as thin in order to eat less, and making an agreement with oneself to do something.

There are also examples of Sd which are covert which are less influenced by specialized self-control response systems. For example in some stereotyped sequence of responses completion of one response

may be the Sd for the next response—completing a turn of the doorknob may be a Sd for pulling the door open. Nevertheless, the turning of the knob was probably not a part of an organized self-control response system the way self-instructions are.

The idea of self-generated Sd is not new, but has ordinarily not been specifically labeled as a subclass of types of Sd. Skinner (1953, 1957) for example provides a number of examples of both overt and "private" self-Sd responses such as setting an alarm or instructing oneself. Staats (1963, 1968) discusses more detailed examples of self-generated Sd. He gives some very elaborate examples of self-Sd verbal instructions in problem-solving, decision-making, and other activities. He has also (1969, 1971) emphasized the importance of attitudinal verbal statements to oneself in controlling approach and avoidance behavior.

Premack (1970) has described self-instruction as the operational consequences of a decision. This could be described as a specialized decision-making response system which includes general responses for implimenting any decision in terms of changing more specific, previously-established habits. The general self-control habit is presumed to include a tendency to generate self-instructions after a decision is made. So whether one decides to stop smoking or to read more, he will so instruct himself in the appropriate situations. These self-generated Sd will hopefully be strong enough to overcome the effects of Sd in the situation which tend to elicit the old undesireable response.

Variables Affecting the Cue Value of Self-Discrimination Responses

Cue Value will be the term this author uses for designating the likelihood that an Sd will elicit a response. The cue value of self-generated Sd must be demonstrated to be affected in a similar way by the same variables that affect any Sd if the concept of self-Sd response is to have much meaning. Such variables as correlated reinforcement schedule, stimulus discrimination and generalization effects, deprivation states, and reinforcement value of the reinforcer must be shown to have expected effects on self-Sd cue value. This remains an unanswered question.

Effects of Self-Discrimination Responses

Another important consideration in justifying the concept of self-generated Sd is whether the effects of varying dimensions of self-Sd are similar to other Sd in their effects on eliciting responses. One expectation is that self-instruction and self-goal setting would increase the probability that relevant responses would occur. Locke, Cartledge, and Koeppel (1968) have reviewed evidence concerning the motivational function of goal setting in knowledge of results studies. In most studies knowledge of results and goal setting variables were confounded. However, in four studies evidence supported the conclusion that goal-setting and self-goal setting had a significant effect. For example subjects setting high goals tended to perform better, though this is just correlational evidence. Subjects in one experiment were learning to improve their automobile driving. They were asked to improve scores on only certain dimensions. It was found that scores on these dimensions improved more than scores on other dimensions. Other

authors (cf. Cheyne, 1970; Liebert & Allen, 1967; and Mischel & Liebert, 1966) have demonstrated the effectiveness of verbal instructions and rules in effecting behavior in "self-control" situations. However, it can probably be presumed that actual self-Sd responses to follow the rules took place. There is no evidence that such responses actually occurred.

Expectancies and Anticipated Behavioral Contingencies

An expectancy can be defined as a response which describes the nature or likelihood of some future event based upon previous learning. Anticipated behavioral contingencies are expectancies concerning the consequences of behaviors given certain initial conditions. An example of a verbal anticipated contingency is the statement, "If I walk in front of a moving car, I may be killed." The same meaning could be expressed through a sequence of images of oneself walking in front of a car and being killed. In actual practice, both verbal and imaginal sequences might occur simultaneously (cf. Paivio, 1971). Skinner (1966) seems to play down the importance of experiments using instructions simply describing situations with "if, then" type instructions. He has a good point in the context of his discussion. (i.e. The instructions are not equivalent to actual behavioral contingencies.) However, the instructions may be important stimuli which have effects on behavior which cannot be duplicated by actual contingencies either. The symbolic contingencies are a separate class of behavior from the contingencies they represent and as such are important. In other contexts (1957) Skinner does give some more weight to verbal anticipated contingencies.

Many previous authors have used the notion of expectancy (cf. Kelly, 1955; Rotter, 1964). However, they have rarely attempted to integrate it with contemporary learning principles. One exception is Ferster (Ferster, Nurnberger, & Levitt; 1962) who has described the discriminative stimulus value of "ultimate aversive consequences" in decreasing the likelihood that overweight people will continue to overeat. They have applied a simple learning analysis.

The attempt here is to give an account of the notions of expectancy and anticipated contingency which is consistent with established learning principles and can be analyzed theoretically in detailed S-R systems as Staats has suggested. Staats (1971, p.256), speaking metaphorically, says of man that "through language he can bring the future events into the present and behave in a manner appropriate to those events." Images can have a similar function.

This author assumes that a generalized expectancy habit is learned in which a certain problem situation (Sd) may come to elicit an <u>anticipated contingency search response</u> (R) in which the subject begins to verbalize and imagine possible consequences of his behavior and assess the probabilities of them. The anticipated contingency search response will be reinforced to the degree that predicted events actually occur and to the extent that accurate prediction helps the subject meet his other needs. For example an overweight girl may be faced with a choice between a low-calorie Tab cola and a high calorie Coke. The choice problem might elicit the search for anticipated contingencies which may generate a verbal statement and image to the effect that if she continuously drinks Tab instead of Coke she will loose more weight and

look better. The anticipated contingency may then serve as a Sd itself to elicit a Tab drinking response. If this habit leads to weight loss, then both the generalized habit of anticipating contingencies and the habit of drinking Tab will be reinforced.

<u>Generalized Habit</u>:

Sd	anticipation search R	R2	Sr
(problem situation) drink Tab or Coke?	(1) search for anticipated contingencies (2) assess probabilities of outcomes		(1) prediction validated (2) specific reinforcement received
	Sd	R	Sr
<u>Specific Habit</u>:	"If drink Tab, will lose weight."	drink Tab	lose weight

Part of the process of anticipating contingencies consists of generating symbols representing possible contingencies and partly consists of estimating probabilities. This is similar to a decision-making analysis such as the one provided by Edwards <u>et al</u>. (1965). Skinner (1957) has also recognized the importance of assessing probabilities. It is possible that certain words such as "certainly", "likely", "possibly", "unlikely", and "impossible" have acquired different strengths or value as discriminative stimuli due to previous conditioning. The inclusion of different probability assessor words in an anticipated contingency statement may influence the statements power as an Sd to elicit other responses.

This author assumes that the anticipated contingency response is one that is learned according to learning principles. It is assumed neither that people are born making explicit predictions nor that they always make them. In any given situation some people will "look before

they leap" and others will not. Whether or not they do depends upon their learning history. Shaping, modeling, or prompting may have led to the initial habit of anticipating contingencies. It is assumed that reinforcement maintains it.

To some degree all anticipated contingency responses are self-control responses. Yet the degree to which a particular response is integrated with a more independent self-control response system is an important consideration. One general self-control technique which a person might use to actualize his behavioral change goals is to anticipate specific contingencies in specific situations. He can imagine himself getting fatter for eating the candy bar while seeing it resting on the table. Some of the hypotheses the author's experiment are concerned with anticipated contingencies and will be discussed further below.

The Self-Reinforcement Response

In self-instrumental conditioning it may not only be possible for a self-control response to function as a discriminative stimulus, it may also be possible for a self-control response to serve as a reinforcing stimulus. A self-reinforcing (self Sr) response is a response which is made contingent on another response and increases the probability of the occurrence of the first response. Bandura (1971) has specified three necessary aspects of a definition of a self-reinforcing event. First the reinforcer should be freely available to the subject during the entire response sequence (also see earlier discussion).

Second, the self-reinforcement event must include some standard of performance. The subject must have some criteria for determining

whether the response was adequate for the reinforcement to be administered. Third, the reinforcement agent is the person himself. As per the earlier discussion he may either administer it directly to himself or set in motion environmental events that will reinforce him.

Premack (1965) has pointed out that all reinforcement situations can be viewed as a high-probability response being made contingent upon a low-probability response. So some "self-control" may exist in all reinforcement situations. However, in being consistent with earlier statements, the prefix "self" is most applicable to behavior change programs that are self-administered as opposed to being other-administered. This is equivalent to saying that the term "self-reinforcement" is most applicable to reinforcing responses integrated with a self-control response system. For example, allowing oneself to turn on the TV because one's work is done is a self-reinforcement response. Here the person attempts to increase his work behavior. But if someone else administers the TV only when the work is done, then the TV viewing is a type of other-administered reinforcer.

It is necessary to show that self-Sr is isomorphic to other reinforcement paradigms in order to demonstrate the meaningfulness of the concept (see earlier discussion of isomorphism). There has been more research related to self-reinforcement than with other types of self-conditioning. Again, it is necessary to show that self-reinforcement functions both as a dependent and independent variable in the way one would expect from the literature on reinforcement in order to show its meaningfulness. These issues will be divided into three parts. First, do traditional learning variables influence the probability of self-Sr

responses in expected ways? Second, are the self-Sr responses effective reinforcers? Third, do expected variables account for their efficacy as reinforcers?

Variables Affecting the Self-Reinforcement Response

There is now a growing body of research which has in general supported the assertion that self-reinforcement responses can be conditioned in ways which are similar to the ways other responses are.

Bandura (1971) has more completely reviewed evidence concerning some of the conditions leading to the acquisition and the maintenance of self-Sr responses. The statements below are illustrative of the evidence.

Differential Reinforcement. Self-Sr responses may be acquired through differential reinforcement. Kanfer and Marston's (1963a) study provides evidence of this. Subjects were reinforced verbally for self-reinforcement after making ambiguous subliminal perception judgements. In another group they were verbally punished for their self-reinforcement responses. These latter subjects came to reinforce themselves at a much lower rate. In my opinion the Liebert and Allen (1967) study was also a case of differential reinforcement. Since praise and criticism by the experimenter was made contingent on the self-reinforcement response in the "high rule-structure" group. That group later followed rules much better in a self-Sr situation.

Prompting. Another traditional way of establishing responses is through prompting or giving instructions. Kanfer and Marston (1963b) found that one group of subjects told to reinforce themselves even if they were not too sure did so more than subjects told to reinforce themselves

only if they were quite sure they were right. Liebert and Allen (1967), and Mischel and Liebert (1966) have shown that verbal instructions about the "rules" of self-Sr can effect self-Sr in expected ways.

Modeling. Modeling has been shown by Bandura and his associates (cf. Bandura and Kupers, 1964; Bandura, Grusec, and Menlov, 1967) to influence the acquisition of self-Sr responses as it does other responses. In their experiments subjects watch a model who reinforces himself at varying rates for different bowling scores. The model uses self-praise or criticism and candy or tokens as reinforcers or punishers. It has been found that children generally tend to adopt the reinforcement standards or rates of the models providing they were appropriate models. (Bandura, 1971, p.86ff. discusses variables which determine the appropriateness of models in relation to Festinger's social comparison theory.)

The Efficacy of Self-Reinforcement Responses

The most important question concerning the effects of self-reinforcing responses is whether or not they act as their name suggests: can these responses act to reinforce other responses? There are a number of studies relevant to this question. Speidel (1972) has completed a review of the efficacy of self-control responses.

A discussion of some of the better and more illustrative studies of self-reinforcement efficacy follows.

Kanfer and his associates have done several studies concerning the efficacy of self-reinforcement. Kanfer and Marston (1963c) found evidence consistent with the efficacy hypothesis. In Phase I they had college students select one of four nonsense words. Predetermined

choices were reinforced by turning on a green light which the S had been told indicated he was correct. There were also three levels of incentive--green light alone (low), light and poker chips (medium) and light, chips, and prizes for chips (high). After each S reached criterion in Phase I, Phase II began. In the acquisition (AC) group the procedure in Phase I was continued. The self-reinforcement (SR) group was told that E would no longer press the button. Instead they were supposed to press the button when they were correct. The extinction (EXT) group suddenly stopped receiving all reinforcement. The dependent variable was frequency of correct responses. The result was that the AC group continued to improve, the SR group remained the same, and the EXT group decreased in number of correct choices. The differences in group means was significant. The incentive variable was ineffective. Thus their results are consistent with the efficacy of self-reinforcement hypothesis.

Spiedel criticizes this experiment on the basis that the SR group not only started self-Sr, but they were also told to continue responding as before. The EXT group was not told this. Her claim is supported by results of a similar Marston (1964) study in which he did warn the extinction group and found they did not decrease in frequency of responding. The issue is not settled however, because it may be that the effect of the warning was to cause subjects to administer covert self-reinforcement. A study should be performed which keeps the Ss occupied with an irrelevant task so they can not administer self-Sr. Bandura (1971) has criticized Kanfer and Marston for equating "correct" with "reinforcement". He suggests, for example, that on simple tasks being

correct may not be nearly as reinforcing as being correct on difficult ones. He has a good point, but that does not obscure the value of being correct as a reinforcer.

A second important study was performed by Kanfer and Duerfeldt (1967). They used a perceptual recognition task in which Ss were asked to identify figures correctly. The main dependent variable was number of correct responses. During phase I all groups except the no-reinforcement (NR) group were given 60% non-contingent reinforcement of a green light for so-called correct responses. In other words correct responses were not really differentially reinforced. During phase II the external reinforcement (ER) group was treated as in phase I after an "equipment check" interruption. The self-reinforcement (SR) group was asked to reinforce themselves as in the earlier study. The extinction (EXT) group received no more reinforcement, but also had an "equipment check" interruption. During phase III all groups received no more reinforcement. An "equipment check" was also made prior to phase III.

At the end of phase I there were no overall differences in number of correct responses and no significant improvement over trials. At the end of phase II there were no overall group differences, but there was a general increase in correct responses across trials. At the end of phase III there were overall group differences and general increases. After phase III, the SR group made more correct responses than all other groups and the EXT group less than others. There were no differences between the ER and NR groups. The SR group was also found to improve in accuracy of reinforcement. The results generally are what

reinforcement theory would predict. First, there should be a slight general improvement due to practice and covert reinforcement for all groups. Second, since the SR group was the only group which was explicitly able to get contingent (self) reinforcement, it should have improved more than others and did. Third, since the ER group was not receiving contingent reinforcement no difference between it and the NR group is expected. The only problem lies in the decrease during phase III of the EXT group. It may have been that the shock of suddenly getting no more reinforcement somehow shook their confidence resulting in disruption of the normal covert self—Sr responses.

Bandura and Perloff (1967) have done the best experiment on the effects of self-reinforcement. The main dependent variable was the number of cranking responses. The task was to turn a crank at a rate to match some preselected level of "5, 10, 15, or 20". A bell rang when the level was reached. The explicit reinforcers were poker chips which Ss knew could be exchanged for valuable prizes. They performed alone. In the SR group children were instructed to set their own standard, then reinforce themselves. In the ER group the standards of each S were yoked to that of a SR subject. In the incentive control (IC) group children were given the entire amount of tokens accumulated by a yoked SR subject at the first of the session. In a second control group (NR) no tokens were given. Results were that there was an overall main effect and that there were no significant differences between ER and SR or IC and NR groups. But there were differences between each reinforcement group and either control group. Thus the results supported the efficacy hypothesis.

A second similar study was done to find out if Sr-Er differences could be explained by the goal setting phenomenon (see above). The only difference was whether the standards were externally imposed or not, neither received tokens. There was no resultant differences in cranking rates.

Speidel (1972) concedes that this is a good experiment, but criticizes it on the basis of possible demand characteristics. For S may have been afraid that E somehow could have checked up on them—even though elaborate precautions were taken. This is of course a possibility.

Another acceptable laboratory experiment by Deysach (1970) also found positive evidence; but a study by Poultney (1969) failed to. An applied experiment by Glenn (1970) also got positive results. Other experiments have more serious shortcomings. The overall evidence from a variety of experiments tends to corroborate the hypothesis that overt self-reinforcement can have a facilitative effect upon responses on which it is contingent. Of course, due to some problems with the experiments, more work should be done.

Variables Influencing the Reinforcement Value of Self-Reinforcers—Self Sr as a Conditioned Reinforcer

A conditioned reinforcer (cSr) is a reinforcer that has acquired its reinforcement value (RV)(i.e. its efficacy as a reinforcer) from conditioning. Skinner (1938) thought that a cSr could obtain its reinforcement value either through classical conditioning or instrumental conditioning. From classical conditioning it would receive its RV as a conditioned stimulus (CS) from being associated with an uncon-

ditioned stimulus (UCS) which elicits some emotional response. From instrumental conditioning it would receive its RV from having previously been a discriminative stimulus (Sd). An example of the classical conditioning being used to change RV would be pairing the word "professional" with pleasant words and then using the word as a reinforcer for work behavior.

<u>Establishing Reinforcement Value Through Classical Conditioning</u>:

CS1 ("good," "outstanding", etc) ——— CR1 (positive emotion)
CS2 ("professional")

<u>Applying Reinforcer</u>:

Sd ——————————— R ——————————— cSr
("please work hard") (hard work) ("It looks professional")

An example of the instrumental conditioning paradigm being used to increase RV would be letting a child take money to the store and buy candy with it. The money becomes an Sd for an exchange response leading to a reinforcer. Later he will work to get money.

<u>Establishing Reinforcement Value Through Instrumental Conditioning</u>:

Sd1 ——————————— R1 ——————————— Sr1
(money) (give it to cashier) (get candy)

<u>Applying Reinforcer</u>:

Sd2 ——————————— R2 ——————————— Sr2
("If you mow yard, you get money") (mow yard) (get money)

More recently Staats (1968) has hypothesized that classical conditioning of emotional responses is the principle most applicable to conditioning change in reinforcement value. He has extended this idea to include words, attitudes, self-reinforcers, various instrumental responses, etc. So that almost any event or object which can serve as a stimulus can acquire reinforcement value this way. His experiments

on semantic conditioning (e.g., Staats, Staats, & Crawford, 1962) and conditioning attitudes (e.g., Staats & Staats, 1958) are consistent with his assertion that classical conditioning can be important. Staats (1963, 1968, 1971) more specifically has discussed examples of how response-produced stimuli can acquire RV through classical conditioning. He also considers "guilt" to be a self-punisher established this way. One example he gives is of a child which has had positive experiences paired with imitating others, so that after awhile imitation per se may be reinforcing. A golfer may work very hard to learn to swing his club like he sees pictures of Arnold Palmer doing it. In both of these examples it is the matching per se that becomes reinforcing. It is not clear the place Staats gives proprioceptive feedback as "response-produced stimuli." Hull and Mowrer more obviously have given it a central place. However, Kelleher (1966) presents an argument questioning the necessity of proprioceptive stimuli intervening between responses in response sequences. Some response sequences (e.g., some piano playing) seem to occur too quickly to allow for this type of feedback.

Staats's argument has particular appeal because of his thesis that "emotional responses" underly reinforcement value. This seems appealing in the light of the evidence relating optional levels of stimulation and arousal to increased motivation (cf. Appley, 1970; Berlyne, 1967; Bindra, 1969; Hunt, 1965). There has been more evidence that classical conditioning principles apply to the learning of emotional responses than instrumental conditioning does (Kimble, 1961). Staats's view presents a potential theoretical bridging principle between arousal and reinforcement research.

It is apparently not the intention of Staats to hold that instrumental paradigm procedures cannot lead to effective changes in reinforcement value, but that classical conditioning underlies this process.

There has been quite a bit of experimental work on the issue of what principle underlies conditioned reinforcement. Both paradigms have proved successful. Keller and Schoenfield (1950) have taken the cSr as Sd position. They cite two studies which apparently failed to find any cSr effect after a classical conditioning paradigm was used. Kelleher (1966) provides the best review of the evidence.

It might be helpful to discover any isomorphism between acquisition of reinforcement value and variables affecting these two conditioning principles. Jenkins and Bersh (1951) found that optimum intervals between cSr and established Sr were 0.5 to 1.0 second--the same as in classical conditioning.

Kelleher also cites an experiment in which Stein (1958) attempted to minimize "operant responding" during conditioning of rats. He did so by pairing a tone with brain stimulation. The tone then became an effective reinforcer for pressing a lever.

Kelleher's own research on rats provides a third attack on the problem. He has compared chained and tandem schedules of reinforcement. He has found that a white light can come to serve as an effective cSr by being intermittantly paired with food even though no programmed response occurs between the white light and the presentation of food. On the other hand other lights serving as Sd for the response leading to food did not always function as reinforcers. This evidence is more consistent with a classical conditioning explaination. Kelleher (p.209)

overall concludes, "The available evidence suggests that stimuli are established as conditioned reinforcers by means of respondent conditioning."

Actually, the lack of occurrence of a programmed response does not mean that a response did not intervene. At this point it is impossible to rule out either principle as an explaination of how neutral stimuli, such as self-control responses, may come to acquire reinforcement value. For the purposes of this review it seems more valuable to point out that both conditioning procedures have been used successfully to increase the reinforcement value of neutral stimuli. It is assumed that self-reinforcement responses acquire reinforcement value the same basic way that other neutral stimuli do. There is some evidence to support this assertion. Both Ascher and Cautela (1972) and Miller and Clark (1970) used classical conditioning procedures to successfully increase the reinforcement value of self-administered reinforcing stimuli. Cautela and Ascher used covert self-reinforcing stimuli and Miller and Clark used overt reinforcing stimuli. These experiments will be described in more detail below.

<u>More Specific Variables Increasing Reinforcement Value of Conditioned Reinforcers</u>. In order to maximize the reinforcement value of the cSr one would need to know what parameters affect it. Kelleher (1966) and Wike (1969) have concluded that a number of variables have been shown to increase cSr of animals. One is a shorter interval between presentation of the cSr and the established reinforcer. Another is higher frequency (or probability) of reinforcement following cSr (p.189). Another is to create a <u>generalized</u> cSr by pairing the cSr with a multitude of estab-

lished reinforcers. This might suggest why words like "good," "beautiful", and "honest" and why general attitudes and moral principles may have such a strong effect.

The parameters of the presentation of the cSr which affect the cSr's influence on instrumental conditioning is a separate issue. Apparently conditioned reinforcers can come to function much in the same way as other reinforcers. For example it has been shown (cf. Keleher, 1966) that various differences in schedules of reinforcement using cSr have expected effects.

Self-Control Response Systems--Combined Functions of Stimuli

In the earlier two sections it was pointed out that self-control responses may serve discriminative or reinforcing functions in self-instrumental conditioning. Also it was pointed out that they can serve as stimuli in self-classical conditioning. It is assumed that in many cases the same stimulus may serve any or all of these functions. For example if the word "good" is used to describe a book it may serve as a Sd by causing the listener to read the book. At the same time it can serve as a previously conditioned stimulus and cause the book to elicit positive emotional responses it did not before. Finally, the word "good" can be used as a Sr. It could be used to describe Johnny's behavior as he reads the book.

Staats (1969) has discussed in some detail hypotheses concerning the human motivation system. He calls this the ARD system. By this he means that motivational stimuli may function as attitudes (A), reinforcers (R), or discriminative stimuli (D). Staats means to include motivational stimuli covered by such traditional terms as emotions,

values, needs, drives, goals, reinforcers, attitudes, etc. As has been mentioned the principle by which he presumes the ARD stimuli acquire their value is through classical conditioning. Staats has described hypothetical "behavior repertoires" (here called response systems) which he says include many of the self-control functions that have been described. These repertoires include imitative skills; achievement standards; verbal-motor, verbal-emotional, and verbal-reinforcer skills; and others.

Many of the more general skills can be used either as self-control skills or as skills for controlling others. For example one can praise a friend for going on a diet, or the friend can praise himself. Each may be the application of a verbal rule (the instrumental conditioning principle) to change a particular habit (eating). The only difference is the target of the response. So in a sense many general skills can be considered part of one's self-control response systems.

Even if there were not unique skills (which there probably are) that a particular individual has developed for changing his own behavior, the concept of a self-control response system might still be quite useful. For it still could be used to describe which set of skills are actually used to change one's own behavior. Thus it might be a category cutting across some of Staats' description of repertoires. Here is an example from a different field of endeavor. An automobile engine may conveniently be said to consist of a fuel system, electrical system, etc. However, when examining faulty starting problems, it may be more useful to think of the starter and carburetor each as part of the starting system, and the lights as part of another system.

Kanfer's (1971) model of a self-control system includes the three aspects of self-monitoring, self-evaluation, and self-reinforcement. He thinks that the initial stimulus for this system's activity may be some sort of disruption of normal chains of (automatic) behavior (cf. Mandler, 1964). Then the person pays attention to feedback from responses (self-monitoring) compares it to relevant social or personal standards (self-evaluation), then reinforces himself according to previous standards of self-reinforcement (self-reinforcement).

The new standards then may serve as Sd for future responses. The term "shaping" has often been used to describe a similar process when the target person was someone other than the shaper. Thus this process could be called "self-shaping", it includes both self-discrimination and self-reinforcement.

Kimble and Permuter (1970) have emphasized the "automatization" aspect of the self-shaping process. Automatization is the process of developing an automatic habit through self-control behaviors.

Self-Punishment and Self-Extinction

The focus of attention in this paper is on self-reinforcement. There have been a number of studies utilizing a self-punishment paradigm (see Boberg, 1968; Cautela and associates' work in covert sensitization discussed below; Martin, 1971; Kanfer & Phillips, 1970, p.435; and Weingaertner, 1969). Even though these are an important type of studies of self-control behavior they will not be reviewed here.

CHAPTER III

COVERT CONDITIONING

Covert conditioning is any conditioning process which is presumed to include covert responses as an important part of the process. Covert responses are responses which are not directly observable. They can also function as stimuli for other responses. A number of examples of covert conditioning have already been given including the controlling function of expectancies, self-instruction, and covert self-reinforcement.

General Problems in Studying Covert Phenomena

There are some major problems in defining and studying covert responses (also see Reese, 1971). It seems that until such time as a device is invented for directly measuring these responses (if they in fact "exist") then the concept can maintain at best the status of an intervening variable or hypothetical construct depending upon the particular author's definition and the amount of "surplus meaning" in the definition (see MacCorquodale & Meehl, 1948). To give the concept of covert response the status of an intervening variable it is necessary to define it both in terms of observable antecedent conditions which effect it and in terms of observable consequent conditions which it in turn effects. In addition the experimental antecedents and consequences which define the concept of the covert response in question should be relatively independent of the experimental events it is supposed to explain. In talking about the interrelation of intervening variables so called converging definitions should be used (cf. Cronbach & Meehl, 1955).

Staats (1963, pp.92-94) provides the example of defining a thinking response using Miller's (1935) experiment in which he trained subjects to have a GSR response to saying the letter "T" overtly. Then he asked subjects to think of "T" when they see one dot and think of the number "4" on every other dot. It was found that the GSR response was stronger to the dots to which they were supposed to think of "T". Here the observable, presumed antecedent of the covert "think T" response was every other dot plus the instructions to "think T", while the observable presumed consequence was the GSR response. Once the "think T" intervening variable had been defined using a series of experiments like Miller's, then the "think T" variable could be used in other experiments. For example one group of subjects could be asked to remember what some ambiguous figure looked like after being trained to "think T" in an earlier phase. Other subjects could be trained to "think four" first. Later on it might be possible to measure differences in GSR and verbal report to see if "thinking T" during recall helped elicit a better drawing of the ambiguous figure. This would be an independent check on the assumed mediation of thinking T by the members of the experimental group.

The hypothetical extension of the Miller experiment is illustrative of a methodology that can be used for studying covert responses. Obviously, it is more tenuous and requires more effort than simply observing responses directly as can be done in experiments on overt responses. Nonetheless, until ways of directly observing covert responses are found, this method must be relied upon.

Applying this methodology to covert conditioning it is advantageous to begin by assuming that principles which apply to overt conditioning apply to covert conditioning as well. The more that it is found that some variables function the same way in covert conditioning as overt conditioning the more reason there is for believing others did also. Although it is not possible to be sure for each variable until that variable is actually tested carefully (cf. Popper, 1938).

Even though there are many methodological problems in studying covert responses, it is important that the study of covert phenomena continue. Even Skinner (1957) seems to recognize the importance of covert conditioning phenomena--especially covert verbal and motivational behavior. However, he seems very reluctant to encourage research on covert phenomena at present because covert behavior can not be directly observed and he dislikes the use of intervening variables in research.

This author disagrees. Not only should new methods be developed for studying covert behavior but also current methods be used to whatever degree they can. To attempt to systematically ignore covert phenomena in research, as some have done, will not help. More adequate theories concerning covert behavior need to be developed. Experimentation on practical applications based upon these theories should also be encouraged. This not only may lead to indirect testing of the theory (cf. Popper, 1938), but also may lead to the development of useful methods in applied psychology. In the area of applied psychology, problems must be dealt with immediately. If methods are not developed from the best theories available--even though the theories have not been

fully tested—then someone will use a method based upon a less adequately tested theory. That poorer theory may be no more than a personal hunch! Systematic desensitization illustrates the successful development of an applied method from a theory that is not fully supported. The experiment suggested here is an attempt to develop a useful method of behavior change from a somewhat untested theory of covert conditioning. This theory is an extrapolation from sound principles of learning developed from research on overt behavior.

The Status of Covert Verbal and Covert Image Responses as Intervening Variables

A number of authors have hypothesized the importance of covert verbal and covert image responses and attempted to describe some of their similarities and differences. Staats (1963) probably goes into more detail than anyone else in describing specific response systems that may ordinarily be assumed covert (e.g., reading, arithmetic, and reasoning behavior). Relevant research is also reviewed.

For example Staats assumes that "round meaning" words such as globe, bulb, and marbles each tend to elicit one common meaning response and that "angular meaning" words tend to elicit a different common meaning response. He further assumed that meaning could be transferred by classical conditioning procedures. Staats, Staats, and Heard (1961) found that subjects presented nonsense syllables paired with the first set of words rated the nonsense syllables as meaning "round" and nonsense syllables paired with the second set they rated as meaning "angular". Another experiment by Russell and Storms (1955) demonstrates even more clearly the power of presuming covert verbal mediation. They used

verbal association norms to construct B-C-D sequences of words (e.g., stem-flower-smell). Then they taught A-B sequences to subjects, where A was a nonsense syllable and B was the first word in the presumed already existing sequence. Then they learned half A-D and half A-X pairs, where X was a non-associate to B and C. They expected that the B-C words would mediate an increase in tendency to elicit D given A. The results supported their assertion.

Skinner (1957) also discussed verbal behavior which is presumed to be covert. However, Paivio (1971) has made the greatest systematic effort to review relevant experimental evidence concerning the status of covert image and verbal responses as intervening variables. His conclusion is cautious, but encouraging.

> We have reviewed the functional significance of imaginal and verbal symbolic processes in relation to problems of meaning, perception, learning, memory, and language. We have found that each of these overlapping areas (and research therein) could be conceptualized reasonably consistently within the framework of a model based on the postulated functional characteristics of the two symbolic systems (p.525).

Paivio has amassed an impressive set of evidence which not only seems to illustrate the utility of theorizing about covert phenomena, but also goes far in defining as separate variables covert imagery and covert verbal behavior. For example he has shown that latencies for the reported discovery of image mediators are greatly affected by the concreteness-abstractness variable of the initial stimulus word. But the discovery of verbal mediators is not so affected (e.g., a subject may more quickly generate an image associated to the word "horse" than the word "truth", but he may generate word associates with equal facility.

Paivio has also asked Ss to draw the covert image or write the covert word which served as a mediator between the stimulus and response word in a verbal memory task. He found that the imagery mediators were more affected by the concreteness of the stimulus word than the verbal mediators were.

There have also been some very interesting experiments which have shown that imagery instructions and presumed mediating stimuli have had effects that one would expect the actual situation represented by the imagery to have. For example Leuba (1940) pairing the ringing of a bell with the smell of cresote found that subjects reported that they smelled creosote later when the bell was rung. An elegant explaination would be that a covert sensory (image) response was classically conditioned to the bell. Leuba and Dunlap (1951) paired a red diamond on a card with a tin snapper sound. Later the subjects reported seeing the red diamond on the card when the snapper was clicked. Bykov (1957) instructed Ss to imagine they were responding to commands such as "get ready to work"; that led to an increase in GSR and heart rate. Antrobus and Singer (1964) found vertical eye movements when Ss were asked to imagine a trampolinist and horizontal eye movements when Ss were asked to imagine someone playing tennis.

The work of the investigators discussed is only illustrative of how effective instructions to use covert responses and setting up situations to cause covert responding has been in research on problems in many areas. Other examples will follow.

Covert Classical Conditioning

Staats has used the principle of classical conditioning of media-

ting (covert) responses to explain a number of important experimental findings. They include sensory preconditioning (see Kimble, 1961, p.215), mediated and semantic generalization (Staats, 1963, pp.98ff.), and conditioned evaluation meaning (pp.140ff.). The last phenomenon has already been illustrated by the Staats, Staats, and Heard (1961) and Russell and Storms (1955) experiments discussed earlier. The Miller, Leuba, and Bykov experiments presented earlier can also be elegantly analyzed using the classical conditioning principle.

Covert Classical conditioning is a procedure in which either the UCS, the CS, the UCR, or the CR is covert. Staats (1963, 1971) presented a number of examples of covert classical conditioning. If Mr. Jones uses the word "ugly" to label his own face, then his face may come to elicit some of the same aversive emotional responses as the word "ugly".

There is a large body of literature which is relevant to the topic of covert classical conditioning including much of the imagery desensitization literature. The topic is mentioned here only to point to its potential importance as a covert self-control procedure and to set the stage for a later discussion of the problem of operationally distinguishing between covert classical conditioning and covert instrumental conditioning.

Studies in Covert Instrumental Conditioning

Covert instrumental conditioning is any instrumental conditioning procedure which involves one or more covert responses as principle elements in the procedure. Any or all of the Sd, R, or Sr may be covert.

Skinner (1953, 1957), Staats (Staats, 1963; 1968), and others seem to think that covert responses can function as Sd, R, or Sr in instrumental conditioning paradigms. This author agrees.

Covert Self-Discrimination

Some examples of covert self-discrimination, such as the use of expectancies and anticipated behavioral contingencies, have already been presented. Several authors have suggested the systematic use of anticipated behavioral contingencies in applied settings. All of the methods have the subjects actually imagine or say positive consequences of desired responses and/or negative consequences of undesired responses. Ferster, Nurnberger, and Levitt (1962), for example, have suggested that target persons imagine in detail ultimate aversive consequences of eating and pair words with these unpleasant images. The words then can be used when tempted to eat.

Homme (1965) has proposed a similar method in which he suggests that in the presence of the usual Sd to smoke one might try making the following series of responses: say an anti-smoking slogan, say a pro-non-smoking slogan, and then do something to get out of the situation. Cautela (1968) also suggests that his methods of covert sensitization, reinforcement, etc. could be used in the situation before the actual overt response is made as a self-control procedure.

One point that is not made clear by some of these theorists is whether they think the presentation of covert self-discrimination responses has the first or second of the following effects. This method may have the primary effect of reinforcing desireable and punishing other, undesireable discriminative responses (desires, urges, drives,

wishes, goals, etc.) that <u>precede</u> the target response. Or the self-discrimination response may have the primary effect of serving as a Sd itself for desireable responses which follow it. This author thinks that both may be effects of this method, but favors the latter. Homme apparently thinks the main effect is to decrease the probability of linking the Sd to R because of the simple interruption. He bases this hypothesis upon contiguity theory.

<u>A Self-Discriminative Response Paradigm</u>:

```
Sd---------------- R1 ---------------- R2 ---------------- Sr
(others                |                (avoid              (.feel better
smoking)               |                 smoking)            .social approval
                       |                                     .self-respect)
          R----------------Sr
   (1) (imagine        (imagine
        smoke) -------  cancer, etc.)

   (2) (imagine        (imagine
        non-smoke) ---  health)
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Another problem which most of the authors have overlooked is the question of what maintains the effort to interject this sequence of covert responses into one's normal habits? Expected, but delayed reinforcement may be responsible for the interjection of these self-control responses. However, it may be necessary to set up artificial or external reinforcements to maintain the interjection of responses if the delayed reinforcement is too weak. In cases where a subject is expected to imagine an aversive event in the chain, it seems that this would be so intrinsically punishing that there would be a strong tendency for this response to drop out quickly. It seems that imagining positive consequences of desireable behaviors would have a much greater likelihood of staying in the sequence longer. Most authors have not discussed

this problem. This may be one of the reasons that some of the results of this method of covert self-control have been disappointing. For example Tyler and Straughan (1970) report an experiment following Homme's procedure in which the "coverant" group lost an average of only .75 pounds in nine weeks--not greater than the control group or a group employing Mee's breathholding technique. Furthermore they report subjects had a difficult time interjecting the extra responses. Kreutzer (1968) found no significant effects of Homme's method. Straud-Johnson (1968) found significant effects using Homme's method over a control group and found it equal to Mee's breathholding technique.

Gardner (1971) used Homme's method in an experiment on smoking in which he found more positive results than some of the other experiments discussed. Subjects in the Coverant Control Positive group were first asked to smoke three cigarettes per session for three sessions during which they also used stethoscopes to monitor respiratory and cricula-tory changes. Then they were to reinforce themselves with high probability behavior for imagining these sounds whenever they wanted a cigarette. A second group of Ss in the Coverant Control Negative group were to follow desires to smoke with low probability behaviors. There was a control group for each treatment procedure. The control procedures were similar except no attempt was made to control contingencies. It was found that the positive strategy resulted in more Ss completely terminating smoking at the end of treatment than the negative strategy. However, at a follow-up four months later the positive effects of the first strategy had disappeared. The differences in results using the positive control and negative control strategy are in line with the

above explainations concerning difficulty with Homme's method as it has been applied (i.e. Ss artificially reinforced for interjecting the response reduced smoking more). It seems important to find a strong enough reinforcer for the interjection of the coverant control responses into the normal behavior sequence.

Covert Behavior Rehearsal

Covert behavior rehearsal is like overt behavior rehearsal (cf. Kelly, 1955; Wolpe, 1969) in which subjects simply practice interpersonal or other responses which they hope to make skillfully in some other setting. The difference is that they simply imagine themselves performing the response, instead of actually doing it. Behavior rehearsal is probably a form of instrumental conditioning in which the reinforcers are often unspecified or not controlled. A student in this author's class who was a marksman, for example, did a project in which he kept track of weekly shooting scores. During a baseline period his scores were steady, but during a period including daily covert rehearsal his weekly scores improved steadily. Richardson (1969, p.56) reports a study by Clark (1960) in which covert rehearsal improved basketball shooting. Richardson (1969) also reports a study by himself and Stuart in which they had students with no previous experience covertly practice on an olympic highbar. Four groups were preselected according to scores on the Betts (Sutcliff, 1965) and Gordon (1950) imagery ability tests (see Richardson, 1969). The tests measured high and low vividness of imagery (VI) and high and low subject control over imagery (CI). The Es found the expected order of rated actual performance--the high CI,

low VI group first; the high CI, low VI group second; the high VI, low CI group third; and the low CI, low VI group last.

McFall and Marston (1970) report a study on overt behavior rehearsal which is relevant here and in later contexts. They used special solicitation procedures to recruit nonassertive Ss. All 42 Ss were seen for one pretreatment session. Treatment groups were seen for four one-hour sessions individually over a three week period. There were four groups—two treatment and two control. All Ss were given a battery of tests including a role-playing test of assertiveness. It had a situation like the ones used for treatment where the S was asked to imagine a situation then tell how he would respond in it. On the first day of treatment the two treatment groups were given a treatment rationale. Then they listened to taped scenes such as one describing how a gas station attendent performed unrequested maintenance upon the subject's car. The Ss were asked to make as assertive a response as appropriate when a bell rang. In the "feedback" condition Ss then listened to their recorded response. In the "no-feedback" condition, they were asked to think about their response. Then the S made a verbal evaluation of his performance in relation to some general guidelines. Each of the six scenes was rehearsed four times. The second treatment session was like the first except that the scenes now included a description of an assertive response by the S and a negative, unfriendly reply by the mechanic. Then the bell rang and the procedure was continued as in the first session. Sessions 3 and 4 were like 1 and 2 except six new scenes were used.

In the placebo therapy control group two advanced clinical students helped Ss explore their problem. In the no-treatment control group Ss

explore their problem. In the no-treatment control group Ss were told they would have to wait for treatment. Later all Ss were brought in to a second assessment session. Also, all Ss were phoned by an accomplice who had once been a professional salesman and timed to see how long it took them to make their first refusal and to get him off the line. Results were somewhat encouraging. Combined treatment groups did better than combined controls on the Wolpe-Lazarus Assertive Scale and role-playing test, the two treatment and placebo-treatment control groups were alike and scored better than the no-treatment control group on self-ratings of anxiety and satisfaction. In the phone test an overall combined measures score showed significant differences between treatment and controls. But none of the separate phone measures reached significance.

McFall and Lillesand (1971) performed a very similar study. They had 11 students in each of three groups--an overt and covert treatment and one control. Their treatment was considerably shorter than McFall and Marston's using a total of only two sessions instead of six. The only tests they used were the "Conflict-Resolution Inventory" which they had designed to test assertiveness and a new role-playing test similar to the old one. In the first session all Ss were given the two tests. They were seated alone in the room. Control group Ss were told that the test was the treatment and were dismissed. Overt and covert groups received exactly the same recorded scenes except for two differences. The overt Ss were asked to respond aloud and the covert Ss to only imagine themselves responding. Also, overt Ss heard replays of their responses and covert Ss were asked to reflect upon their response.

Both groups received a treatment rationale, then received refusal training in five situations. The presentation sequence included presentation of the responses of one female and one male model, coaching by the narrator, the replay or reflection, and a second response by S.

The treatment took a total of about 20 minutes. In the second session there were several phases. First, a treatment like the one in the first session was used using five new scenes. Next, the role-playing test and CRI were readministered. Then, three to five days later, Ss were called and asked to help the phoner stuff envelopes for three hours.

The Conflict Resolution Inventory has two parts. On the global rating of self-assertiveness all groups showed significant improvement with no differences between groups. On the specific refusal situations the combined treatment groups had a greater effect than the control group (including overall F difference). On the role-playing tests, the covert group improved more than the overt which improved more than the control. On both the Conflict Resolution Inventory and role tests analysis showed the covert group performed significantly better in the situations designed to test for generalization effects. In the phone situation the trend was in the expected direction, but results were not significant.

This is a very interesting study that seems well executed. However, there are still some problems. First, there is a possibility that their control group is not an adequate placebo control. Also, there is an unfortunate confounding. The covert and overt groups differed not only on overtness of response, but also on whether they heard a replay of

their own response. Sarason (1970) found that watching video replays of behavior rehearsal actually was less effective than having no such feedback. There is another problem concerning the use of the role-playing scenes and Conflict Resolution Inventory. Each had scenes highly similar to the treatment scenes. It could be that just listening to these treatment scenes could cause improvement. The role of responding and reinforcement remains unclear. The similarity between the Conflict Resolution Inventory, role test scenes, and training scenes also leaves the question of generalization of effects unclear. The results of the phone test are somewhat discouraging. However, considering that treatment lasted a total of about 40 minutes, and the trend was in the right direction, all may not be lost. Considering the brevity of treatment, the overall results seem encouraging.

Both of these McFall studies seem promising and are procedurally very similar to the author's experiment. The main theoretical difference is in the use of reinforcement. McFall and his associates did not explicitly manipulate reinforcement in either study. However, some reinforcement is obvious in both cases. In the first study the Ss evaluated their own response according to some guidelines they had been given. In the second study the Ss received feedback by listening to how models responded and were then given coaching. Covert self-reinforcement and punishment should result as a consequence of comparing their own behavior to those standards. The similarities and differences in behavior between first and second responses to the scenes shoud reflect these reinforcement and punishment effects. However, the authors did not report these results.

Covert Reinforcement

Covert reinforcement is a self-conditioning process in which the response of reinforcing oneself cannot be directly observed by others. It seems that covert reinforcement could be used to reinforce either overt or other covert responses. Skinner (1953, 1957) and Staats (1963, 1968) and others have discussed covert reinforcement and given numerous examples. Homme (1965, 1966) was one of the early writers to discuss covert reinforcement explicitly at some length. He hypothesized (following Premack, 1965) that high probability covert responses could be used as reinforcers for low probability responses.

Also, the paradigm he suggested for applied treatment has been discussed under covert discrimination since it occurs before the target response and seems to act more as a Sd (see the earlier discussion).

Cautela and his associates have done most of the research in the area of covert reinforcement. He, like the author, seems to think that covert responses can serve effectively as reinforcers or punishers in ways isomorphic to overt responses. He has investigated covert reinforcement, negative reinforcement, extinction, and punishment paradigms to demonstrate this isomorphism. Generally, his results have been encouraging.

General Description of Cautela's Covert Reinforcement Procedure. Cautela's (1970) general clinical procedure for covert reinforcement is as follows. (1) First some assessment procedure is used for identifying high reinforcement value (RV) scenes. The main device for this is the Reinforcement Survey Schedule (RSS) (Cautela & Kastenbaum, 1967). In this test a total of 54 different activities, objects and situations are listed

and Ss rate each on a 5 point scale. After taking this test the S ranks the items rated highest in the RSS. In doing this the S is asked to actually imagine himself in the scene. Other sources of getting information about RV's may also be used.

(2) Cautela doesn't say anything about any other preliminary steps he goes through; however, surely he must offer some rationale to the subject. In a description of "covert sensitization" (Cautela & Wisocki, 1971) he says his second step is explaining the rationale.

(3) If scenes describing the behavior and setting are to be used, they are then constructed at this time. Cautela believes that there is no need to construct a hierarchy as in desensitization if approach responses are the target behaviors. If avoidance behaviors are the problem, then incompatible approach behaviors are reinforced.

(4) Next, the S is told that when the therapist says the word "reinforcement," he should imagine a certain reinforcing scene then raise his right index finger to signal when he has a clear image of the scene.

(5) Scenes are then presented twice. An example follows of the presentation of a scene to a male treated for homosexuality who was reluctant to call a girl for a date.

> I want you to imagine that you are home in the kitchen and you say to yourself, "I think I'll call Jane for a date." When you have that scene clearly, raise your finger. (As soon as he raises his finger to signal clear imagery, the experimenter says, "Reinforcement.") Was the delivery of the reinforcement clear? All right, let's continue. After you've decided to call Jane, you walk toward the phone and you start dialing. Raise your finger when this is clear. ("Reinforcement.") All right, now you have finished dialing. Jane answers. You say, "Hello" and ask her if she is free Saturday night and tell her that you would like to take her out. Raise your finger when this is clear. ("Reinforcement.") Now do the whole procedure yourself. Imagine you decide to call. Deliver a reinforcement to

> yourself, then imagine you are dialing, then deliver a reinforcement to yourself. Then imagine you are asking for a date and again deliver a reinforcement to yourself. When you are all finished, raise your right index finger. Now take your time. Make sure you get clear imagery. You can see the kitchen. You can see and feel the phone, etc. Also try to imagine that you are comfortable and confident while you are in the kitchen going through the procedure. All right. Start. (Cautela, 1970).

Cautela suggests that several reinforcing scenes be used to prevent satiation.

(6) The S is then told to practice at home twice per day and is encouraged to perform the relevant overt behaviors during the week. He is also told to deliver the same covert reinforcement to himself in the actual situation.

Applied Studies of Covert Reinforcement. Wisocki (1970) reports a successful treatment of a 27-year-old female for obsessive-compulsive behaviors such as compulsive clothes-folding. She combined a covert punishment technique for too much folding with a covert reinforcement procedure like the one described above to get the subject to do alternative activities such as stopping and looking at the children outside, going shopping, and folding clothes hurriedly. According to the patient's records within six weeks average times for bedmaking decreased from 30 to 10 minutes, rinsing dishes from 60 to 20 minutes, clothes folding was done in one quick trip, and sexual relations with her husband improved. Three and 12 month followups showed no relapse. Cautela (1971a) also briefly described two additional cases in which covert reinforcement worked. Unfortunately he reports no overall success rates, etc. The studies by Homme and associates have already been discussed.

Laboratory Studies of Covert Reinforcement. Cautela (1970) reports an unpublished study by himself, Steffan, and Wish in which they showed Ss slides of circles. The Ss' task was to estimate the diameters of the circles. The covert reinforcement (COR) was given the word "reinforcement" following overestimation (or underestimation) of the circles. Apparently a procedure similar to the one described above omitting steps 2, 3, and 5 was used. There were four control groups. One group was given no covert reinforcement (No COR), one group was given non-contingent COR, one group was given the word "reinforcement" without instructions to imagine scenes (social reinforcement), and one group was asked to imagine neutral scenes after over-or underestimation. The COR group had more over-or underestimations than any other group.

The investigators made a good attempt to eliminate alternative explainations. They didn't say if the "neutral scene" group received the word "reinforcement" also, but this seems like it would be the best control. Then it could probably be assumed that effects were due to differences in RV of the scenes. However, whether that reinforcement is due to information about the social correctness of his response or due to the inherent RV in imagining dull scenes might not be a sign that they did very well. Then there is always the possibility that demand characteristics of the experiment (Orne, 1962) influenced the outcome, though by use of the "reinforcement" and "neutral scenes" groups demand characteristics may have been partially controlled for. Another question that remains unanswered is what were the subjects doing during the time they were supposed to be imagining scenes? All that can be said is that they were instructed to imagine and that they reported (by

the finger raising) that they did. This then appears to be Cautela's operational definition of imagery. This does nothing to take away from the importance of the procedure, but it does not provide much additional information about the nature of the presumed covert responses.

Cautela (1971a) reports an unpublished study by Kropp to test effects of covert reinforcement on children's statements about themselves. He used 34 children who had varying clinical diagnoses of problems. They were administered a standardized self-concept scale in which the E would read items such as, "I am satisfied with the way I am." The child was to answer "true" or "false". In the covert reinforcement (COR) group the E read the items one day later to them and asked them to imagine a pleasant scene. The overt reinforcement group followed the same procedure except the reinforcement was candy or a token. In the control group no reinforcement was given. Retests one hour and two weeks later both showed the COR group had changed significantly and the other groups had not, though no report is given whether the change was significantly greater than the other two groups. Kropp's study was not as well controlled as the previous one, but it appears to fit the covert reinforcement paradigm.

In another study Ascher and Cautela (1972) first asked Ss to estimate the size of circles in order to establish a baseline. Ss in the experimental group were asked to imagine "the most noxious situation that you have ever experienced". Then they were asked to "imagine that the bell is ringing, and as you imagine this, the noxious scene will disappear". Thus it appears that a classical conditioning type procedure was used to condition the formerly neutral bell so that

it would acquire reinforcement value from being paired with the termination of the aversive stimulus. During this stage Ss in control group A imagined scenes of the ringing bell and scenes of the aversive event, but these images were not paired. Subjects in control group B took part in an informal interview and did not imagine scenes. During the next stage of the experiment all Ss were taken to a room in which they were asked to estimate the size of circles. In a counterbalanced design the E said the word "bell" to Ss whenever some overestimated and when others underestimated the sizes of the circles. It was found that Ss in the experimental group over-and underestimated the sizes of the circles more than Ss in the control groups. The control group means did not differ significantly. Apparently the authors considered that during the first phase of the experiment a covert negative reinforcement procedure was used. A classical conditioning paradigm seems more appropriate. During the second phase of the experiment, apparently the E saying the word "bell" was the overt reinforcing event. One cannot know whether this was reinforcing because of the previous association of the word "bell" with the image of the bell ringing or whether the E saying the word "bell" elicited an image of a ringing bell, which was reinforcing. The former case would be an example of overt reinforcement, the latter of covert reinforcement. Therefore this experiment was not a good test of the covert reinforcement hypothesis.

In another experiment Flannery (1972) performed an experiment in which he found nurses with strong fears of laboratory rats. He divided them into three groups and tested the effects of three procedures upon reported fear of rats and actual approach to the rats. All Ss took the

Reinforcement Survey Schedule (Cautela & Kastenbaum, 1967) and learned the necessary pre-training procedures for Cautela's covert reinforcement training. The covert reinforcement consisted of imagining an individualized pleasant scene whenever the E said the word "reinforcement". In this experiment there was no control for the social reinforcement value of the E saying this word, which limits its value for testing a covert reinforcement hypothesis. The group receiving covert reinforcement for actual approach responses improved more than the group receiving covert reinforcement for covert approach responses, which improved more than the attention-placebo group. This order of improvement was consistent across reported-fear and behavioral approach measures.

Cautela, Walsh, and Wish (1971) had a control group of students imagine a mental retardate, and practice that image all week. The covert reinforcement group would first imagine the mentally retarded person, then would imagine a pleasant scene. Again paper and pencil test attitudes changed more for the experimental group than for the control group. The problem with this study is that it is not really designed to test the instrumental conditioning effect of covert reinforcement. It superficially, at least, fits a classical conditioning paradigm, because it involves the presentation of a neutral stimulus (retardate) then the presentation of a positive emotion eliciting stimulus without an image of an instrumental response intervening.

Studies in Covert Negative Reinforcement

Cautela (1970b) has discussed a covert negative reinforcement procedure which he believes is similar to overt negative reinforcement

phenomena. This procedure is similar to his covert positive reinforcement procedure except that subjects are asked to imagine that a covert response is followed by the termination of an aversive stimulus. Cautela and Wisocki (1969a) performed a controlled study which may be relevant to this hypothesis. Undergraduates answered a checklist one week prior to the experiment. In the experimental groups Ss were asked to imagine a scene in which they were bleeding and in pain. Then they imagined that they were comforted by an elderly person. The control group Ss did not imagine such a scene. Ten days later all Ss were retested. Experimental Ss showed greater changes than control Ss. The problem with this experiment is that like the study on attitudes toward the mentally retarded, it does not really seem to fit the instrumental paradigm as well as the classical conditioning paradigm.

In the Ascher and Cautela (1972) experiment discussed in the last section the authors called their procedure "covert negative reinforcement". However, it does not really appear to fit the negative reinforcement paradigm as well as the positive reinforcement paradigm. The bell may have received its reinforcement value from having been paired with the termination of the image of the aversive scene. However, this fits a classical conditioning paradigm for the conditioning of reinforcement value. In the part of the experiment which better fits the instrumental paradigm the over-or underestimation of circle sizes is followed by onset of the bell, which is a positive stimulus.

Studies of Covert Extinction and Punishment

The focus of this paper is upon covert reinforcement. However, the studies of other instrumental conditioning phenomena help support the

more general theory asserted here that covert responses obey the same laws as overt ones. In covert extinction Ss imagine the performance of the undesireable response in a scene which excludes some usual reinforcement. In covert punishment (Cautela calls it "covert sensitization") an aversive scene is made contingent upon the real or imagined undesireable response.

Most of the clinical and laboratory studies have been done on covert sensitization since it is the earliest procedure employed by Cautela (cf. Cautela, 1967). Cautela (1971b) only reports a few case studies using covert extinction and gives no rates of improvement. Cautela (1971a) reports an unpublished study by Viernstein who found that covert sensitization reduced smoking significantly more than placebo and no-treatment groups after a 5-week follow-up. He reports a number of other poorly controlled or small sample-sized studies that also have found positive results in cases of alcoholism, homosexuality, self-injurious behavior, and overeating.

Cautela (1971a) reports an unpublished study by Barlow, Agras, and Leitenberg which explicitly tested the possibility that the effects of covert sensitization are due to expectancies. The subjects were two homosexual males. They were first told to relax while imagining sexually arousing scenes, but were told the relaxation would cause a decrease in arousal (though the investigators expected an increase). In the next phase aversive scenes of vomiting followed sexual material, but Ss were told this would increase sexual arousal (though the investigators expected a decrease). Ratings and measures of penile volume showed arousal patterns expected by the covert sensitization hypothesis

and opposite those the subjects were told to expect. A six-month follow-up showed no relapse of homosexual behavior. This is a poorly controlled study. It should be replicated using more control, and possibly more subjects. One possibility is that the Ss guessed the E's hypothesis, but that does not seem too likely. Overall it was a very interesting demonstration.

There have been a number of other studies which have been concerned with the effects of covert punishment (or covert sensitization). Berecz (1972) found that a group of Ss who used self-administered punishment of imagined smoking reduced their smoking more than either placebo control procedures or overt smoking treatments. Janda and Rimm (1972) found that a covert sensitization technique caused greater weight reduction at the end of treatment and at a six-week follow-up than either a placebo treatment or no treatment. Wagner and Bragg (1970) compared five smoking treatments. The results were rather complex, but in general a combination covert sensitization--desensitization procedure worked best. However either method alone was not as effective. Sachs and Bean (1970) found that covert sensitization was more effective in reducing smoking than a self-control technique and a placebo control technique. The self-control technique consisted of training in avoiding antecedents (discriminative stimuli) of smoking behavior. Lawson and May (1970) using a small sample found no differences between covert sensitization, contingency management, contractual management, and a non-directive form of counseling. They found decreases across time for all treatments. In general then, it appears as if covert punishment procedures have been effective in reducing at least temporarily the fre-

quency of habits that are generally considered to be very resistent to change. However, there is little evidence that covert punishment, per se is the effective variable. For example social reinforcement may have caused it.

Conditioning of Covert Responses

All of the studies discussed thus far have really tested the effects of covert reinforcement on overt responses more than on covert responses. Cautela (1970a) assumes that his clinical covert reinforcement procedure will work on overt responses through covert reinforcement of covert responses. An important part of this assumption and of the assumption that covert learning principles are isomorphic to overt learning is that covert responses increase in probability when reinforced.

Mahoney, Thoresen, and Danaher (1972) have performed an experiment which tests the effect of an overt reinforcer on a covert response. They used two measures of the frequency of imagery, which was the covert response they were studying. The first measure was Ss' reports of their frequency of imagery. The second was based upon findings by Paivio (1971) and others which have produced strong evidence that the use of imagery as a mediator in paired-associate learning is more effective than the use of words as mediators or the use of repetition. Subjects were given paired-associate training and allowed to choose from one or four methods of remembering items--imagery, sentence, repetition, and "other". All Ss were first taken through a baseline period without reinforcement. Then all Ss were reinforced in three different phases. Subjects in the first group were at first given a dime for each imagery response, then given a dime for each repetition response, then were

given a dime for each imagery response again. Subjects in the other group received reinforcement in an opposite pattern—repetition, imagery, repetition. Subjects were not given recall tests until the end of the whole procedure for fear that their choices would be affected by the superiority of recall using the imagery method. The patterns of the frequencies of the covert learning methods reported varied as expected. In addition the accuracy of the Ss' reported use of imagery and repetition was checked by comparing recall on items Ss reported using repetition vs. items Ss reported using imagery. For the items on which imagery was reported recall was significantly greater. In a second experiment the authors performed a similar study using punishment for covert responses. They found results that would be expected from applying instrumental conditioning principles. In a case study Mahoney (1971) reports that a client used self-punishment (snapping a heavy rubber band on his wrist) to decrease negative thoughts about himself and reinforcement (smoking) to increase positive thoughts about himself. Thus some additional support is provided for the applicability of conditioning principles to the study of covert behavior.

Covert Reinforcement—A Classical or Instrumental Conditioning Phenomenon?

An attempt has been made in this paper thus far to differentiate classical from instrumental conditioning as procedures and as principles. Separating the two is very difficult even for overt responses. Some of the problems as they relate to the question of which principle best explains conditioned reinforcement have already been discussed. Das (1969) has reviewed studies which have successfully applied the instru-

mental conditioning paradigm to get change of responses normally changed only by classical conditioning and vice-versa. Arguments for either principle as the fundamental one underlying the other can be made.

There are two particularly difficult problems in studying the two types of conditioning. First, did some response occur between CS and UCS which was increased in probability or not? Second, did some reinforcer occur after the CR to reinforce it or not? In the long sequence of S and R that occur in any study it is difficult to control or even detect every instrumental R or Sr.

In studies of covert conditioning these problems are greatly magnified. This is especially true in the studies where both the R and S are supposed to be images. For example it is difficult to tell whether desensitization is really an association between the formerly feared stimulus and a positive stimulus, or whether the positive stimulus acts as a reinforcer for covert representations of approach responses. The same problem exists with covert reinforcement. There is no good way to find out until subject's covert responses can be operationalized better.

One way to operationalize this difference between conditioning procedures is in terms of differences in instructions and subjects' reports of what they imagined. This is not an entirely adequate way, but it is a beginning. In covert classical conditioning one can parallel overt conditioning by asking subjects to imagine a neutral stimulus followed by a previously conditioned stimulus. Subjects' reports of their covert Rs should correspond to this sequence. The E should expect greater changes in "involuntary" responses such as emotional

responses. In covert instrumental conditioning the S is asked to imagine himself performing some instrumental response in a certain situation, then receiving reinforcement for it. Verbal report should again correspond to instructions. The E would expect greatest change in similar overt instrumental responses (cf. Kimble, 1961). These are very hazy distinctions, but may still be useful in generating useful experiments and applied methods. Of course these unsophisticated methods can not be used to make clear statements about underlying covert processes.

In the Ashem and Donner (1968) experiment on alcoholism there is a particularly difficult problem of classification. The authors classified an image of drinking as the CS and the unpleasant scene following it as the UCS eliciting an unpleasant response. They could have just as well called the drinking the R and the unpleasant scene the Sr-. Using this author's above convention one would probably classify this as classical conditioning if they had emphasized the stimulus aspects of drinking and expected the S's emotional responses to be the focus of most immediate change. It would be instrumental conditioning if they had emphasized the response aspect of drinking and measured change in frequency of drinking. Of course this is convention only! Nothing can be said of the underlying principle based upon such vague distinctions. Hopefully this is at best a temporary measure until more adequate operational definitions can conveniently be used.

A problem which is related concerns the difficulty of differentiating between desensitization procedures and covert rehearsal or covert reinforcement procedures. This problem is particularly acute when the

behavior being covertly rehearsed or reinforced is approaching a feared stimulus. There does seem to be a fairly clear distinction between investigators' descriptions of desensitization and covert reinforcement. In the desensitization procedure relaxation training is undertaken or some other positive stimulus is paired with presentation of the feared stimulus (real or imagined). This appears to fit a classical conditioning paradigm better. In the covert reinforcement procedure the approach response is imagined (or actually made); then the covert reinforcement is given. While there are clear differences in discriptions of the two procedures, in practice the differences may not be so great. It is possible that many therapists use a combination of the two. For example during desensitization the S may go ahead and imagine a positive outcome, or he may be reinforced overtly in various ways by the therapist following his imagining the feared stimulus. On the other hand the therapist using covert reinforcement may do many things to cause the S to feel relaxed before he imagines the approach response. Finally, the actual scenes imagined may be very similar. The Flannery (1972) experiment was designed to test covert reinforcement procedures on approach behavior and elimination of fear. He found that covert reinforcement of overt approach responses was more successful than covert reinforcement of covert approach responses. The second procedure was more successful than an attention placebo control. The results were consistent for both approach behavior and reported fear reduction. Thus the results of this procedure parallel those of desensitization--both procedures seem effective in reducing fear and increasing approach behavior.

An even more difficult problem is differentiating between covert rehearsal and the other two procedures. The problem of distinguishing between covert rehearsal and covert reinforcement is discussed elsewhere. However, the covert rehearsal procedure is very similar to the desensitization procedure also. When desensitization focuses upon making a feared instrumental response the differences are vague. Yet the differences that are stressed here are the conscious pairing with a relaxation stimulus and the nature of the target response (fear or approach). Also, while shaping may be used, no graded hierarchy is generally used in covert rehearsal. Instead the goal response is usually practiced from the beginning. Probably both procedures are enhanced by therapists' subtle reinforcements for imagining or performing the response. A final difference is that covert rehearsal is more often used as practice in developing a new skill even when one has no fear at all. Desensitization literature focuses almost exclusively on reducing fears and increasing approach behavior.

Of course these are rather subtle and possibly superficial differences between these procedures. It is possible that the same causal processes are responsible for the effects of desensitization, covert rehearsal, and covert reinforcement. However, at this time it may still be somewhat useful to make distinctions in these procedures until it is clearer what processes underlie them.

CHAPTER IV

THEORETICAL ANALYSIS OF EXPERIMENTAL PARADIGM AND STATEMENT OF SPECIFIC HYPOTHESES

To summarize at this point may help the reader get a better perspective on the hypotheses that are to be tested. First a general definition and a number of dimensions for describing self-control behavior were presented. This definition emphasized the nature of self-control responses as responses which manipulate the variables controlling other responses. The free availability of controlling stimuli (such as reinforcers) was thought to be an important part of the self-control definition.

Self-control response systems such as "imitation", "expectation" and "self-shaping" skills were also presented as having important theoretical significance. These systems probably are to a high degree learned and maintained by external stimuli such as delayed reinforcement. Some possible distinctions between classical and instrumental self-control phenomena were discussed.

It was asserted that covert self-control responses are a special type of self-control response, and that both covert and other self-control phenomena obeyed the same conditioning laws as overt and non-self-control phenomena. More specifically research in overt self-reinforcement and covert self-reinforcement was examined. Research in the former area was found to be less than totally adequate, but in general was mildly supportive to the self-reinforcement hypothesis. It was asserted that self-reinforcers are one type of conditioned

reinforcer. Some of the implications for establishing reinforcement value for self-reinforcers was discussed--the effect of classical conditioning was emphasized. Also, associating a conditioned reinforcer with a variety of stronger reinforcers makes it a generalized conditioned reinforcer. This reduces the dependence on one or two external reinforcers and makes it appear to be more "autonomous".

Covert conditioning phenomena were also discussed in some detail. Much covert conditioning is considered a type of self-control phenomena. There are problems of studying unobservable covert responses and defining them as intervening variables. Yet research has shown that such definitions of verbal and imagery covert responses have been very useful in a number of areas including verbal learning, memory, perception, language meaning, desensitization, and covert behavior rehearsal.

The area of covert reinforcement is of particular relevance for this paper. There are very few methodologically sound experiments in that area--though they are generally supportive to the hypotheses presented herein. Only the Cautela, Steffan, and Wish (see Cautela, 1970) experiment adequately controls for social reinforcement. Other problems exist in attempting to distinguish the covert instrumental response from the covert reinforcer and in attempting to separately define covert instrumental conditioning from covert classical conditioning. Relying upon verbal report and parametric studies seems like a stop-gap solution until better methods can be found. This is far from an ideal solution. Still, it is asserted that these difficulties should not prevent research in the area. More experience with covert behavior should lead to better methods. Also, there may be many useful applied techniques

that can be discovered even though the theoretical base may not be as strong as one would like. In conclusion there is evidence which supports the utility of applying conditioning principles to covert behavior. In addition there is no strong reason to think that covert behavior should be essentially different from overt behavior.

The Experimental Paradigm

In the experimental paradigm presented here there are three treatment groups. One is the Covert Rehearsal Reinforcement (CRR) group, in which subjects are instructed to imagine themselves making friendly assertive responses in various social situations. They also imagine a positive response by the person they imagine themselves talking with. The second group is the Covert Rehearsal Neutral (CRN) group. They are treated identically to the CRR group except that they are instructed to imagine less positive responses on the part of the person in the imagined scene that they are conversing with. The third group is the Placebo Control (P) group. These subjects are told that they are being given a treatment also, but the treatment simply consists of a brief lecture on the Id, Ego, and Superego and they are asked to think about some questions related to the discussion and their personal experiences. They are told that this is a method of "guided self-exploration".

Theoretical Analysis of the Experimental Paradigm

The first set of hypotheses concerns the applicability of the instrumental conditioning principle to covert behavior. In the proposed experiment it is assumed that covert verbal and image responses can serve as discriminative stimuli (Sd), responses (R), and reinforcing stimuli (Sr). The operational definitions of the covert Sd, R, and Sr

follow. The Ss are given instructions to imagine a setting (covert Sd), imagine themselves making a response in it (covert R), and imagine some reinforcing scene (covert Sr). It is presumed that these instructions elicit actual covert Rs. This presumption could be tested by the S's rating the images' clarity later. This rating is not a completely satisfactory demonstration, since variables other than the occurrence of the covert R may control the verbal report. However, it is an acceptable method.

It is hypothesized that the following four related instrumental conditioning processes occur in this experimental paradigm.

Instrumental Conditioning of Covert Responses. It is assumed that there are two important classes of Sd present in the experimental situation. One is a set associated with the experimental setting itself (experimental Sd), such as the E, the room, the listening equipment, the testing room, etc. The other is the covert Sd of the setting described on the tape (covert Sd). This is the image presumed to take place as a response to the instructions to imagine the scenes. It proceeds the presumed covert R. Since both the experimental Sd and covert Sd occur before the covert R and Sr, it is expected that both function as Sd. The frequency of occurrence of the covert R (imagining oneself being assertive) should increase in both settings.

There is a third important Sd not present in the training room. That is the Sd in the natural environmental situation, which it is hoped the actual target R will occur in (natural Sd). An example would be actually sitting next to a stranger. It is expected that the covert R would also occur more in the presence of natural Sd through stimulus

generalization because of the similarity between the covert Sd and the natural Sd (cf. Kimble, 1961). For example the covert Sd of imagining sitting next to a stranger in the cafeteria seems similar to actually sitting next to a stranger in a real cafeteria. It is assumed that the covert R of imagining oneself speaking to a stranger would generalize to the real cafeteria situation. Sitting next to a stranger in the testing situation might also be included as a natural Sd.

All of these predictions about the conditioning of the covert response are important; but not all are of central interest in this experiment, and not all were directly tested. However, they are all fundamental theoretical assumptions underlying the specific hypotheses tested. Some of these hypotheses were indirectly tested, however. If Ss do more frequently elicit a covert image of themselves talking to others in these situations, then this may increase their expectations that they would actually perform that response. (See the earlier discussion on expectations.) This change in expectations could be measured by verbal reports of what the Ss expect to do in social situations. In the actual experiment the PEN Extraversion Scale and Friendly Assertive Expectations Questionnaires were used to measure changes in expectations.

Generalization of Conditioning to Overt Responses. There is some evidence that response generalization can occur between overt responses (Kimble, 1961). It is hypothesized here that generalization will occur between the covert target R (imaging oneself being assertive) and the overt target R (actually being assertive). The measure of this was an actual, fairly unobtrusive measure (cf. Webb, Cambell, Schwartz, &

Sechrest, 1966) of talking with a stranger. The change in the percentage of free time spent talking from pretest to posttest was a dependent variable.

Effect of Related and Unrelated Reinforcers on Generalization. A related reinforcer may be defined as one which is presented in this training situation and is representative of the reinforcers the subject would actually find or expect to find in the natural environmental setting after his overt target R actually occurs. An unrelated reinforcer is one that occurs in the training setting but is unrepresentative of those occurring in the target setting for that response. Representative means that the reinforcer in the setting is itself likely to occur or that it is symbolic of one that might occur.

In an earlier section of the paper a section was devoted to the discussion of the role of anticipated behavioral contingencies. It was hypothesized that anticipating behavioral contingencies is a learned habit which can have powerful self-discrimination effects on other responses. The Ss may receive reinforcement equivalent in all other respects except relatedness. This should have an equal effect upon the tendency to elicit the covert R in that situation. But the subject should be able to discriminate the artificial training situation (experimental Sd and covert Sd) from the natural environmental situation (natural Sd). To the degree that the covert reinforcers in the artificial training situation are related to those the S might really expect in the natural environment situation, then they should have a greater effect on generalization than unrelated reinforcers.

The author's greatest criticism of Cautela's procedure is that he uses unrelated reinforcers. For example a boy might imagine himself at a football game as a reinforcing scene for approaching a girl for a date. That is fine if that is where the date is to be, but being at a game is not really contingent upon approaching a girl. Therefore he would not expect to really get to go to a football game because he asked the girl for a date. Thus that expectation could not serve as an Sd to elicit approach responses. More related outcomes would be her agreeing, having fun on the date, or even the distant possible related outcome of marrying her or having a home and family.

It is assumed that the expectancy habit serves as a covert response which mediates the generalization from the experimental situation (experimental Sd and covert Sd) to the real situation (natural Sd). But it will do so more if the covert and artificial reinforcers in the experimental situation are like those anticipated in the natural Sd. In other words he might make a response such as, "I could really have that (related Sr), if I am friendly." This mediation by an expectancy R could serve as an Sd to increase the chance that the S would elicit an overt friendly response toward a stranger. If unrelated reinforcers are used, discrimination training may occur--even in the training situation. The subject may say to himself, "That sounds great, but it can't happen to me in real life."

Training Situation:

Experimental Sd: (room, E, etc.)--R (cooperate)--Sr (E's praise, etc.)

Covert Sd: (Image of cafeteria setting, etc.) --Covert R (Image of assertive R)---Covert Sr (Image of friendly reply)

Natural Situation:

Natural Sd--Covert Expectancy R (acts as Sd)--Overt R--------Sr
(actual cafeteria setting, etc.) (assesses likelihood of getting Sr given Sd and R.) (actually is assertive) (friendly reply)

Covert Sd ---------- Covert R ---------- Covert Sr
(Image of cafeteria setting, etc.) (Image of assertive R) (Image of friendly reply)

In this study an attempt will be made to find covert reinforcers which are similar to the reinforcers the subjects might expect in their actual life situations.

Conditioning A Generalized Self-Control Technique. Another result that is expected from this procedure is that treatment group subjects will learn how to apply this general covert conditioning technique to change other habits. They may also use it to help others change their habits. This was not measured in the experiment, though.

Variables Affecting the Strength of Conditioning

Reinforcement Value of the Scenes. In order for the scene outcomes to be covert reinforcers, they must be "high probability" covert responses themselves (Premack, 1965). It is also assumed that Ss' ratings of the pleasantness of these outcomes can be used as a crude measure of their reinforcement value (RV). It is assumed that the scenes used in the experiment would get reinforcement value from similarity to past images, verbal description, and actual pleasant situations the Ss have experienced. Yet this type of conditioning may be rather weak. A more complex experiment might attempt to establish the RV of the scenes experimentally (cf. Ascher & Cautela, 1972). It would be a good idea, but it is time consuming and hopefully not necessary. Nevertheless it

is important that care be taken in selecting reinforcing scenes. It is important that there be a large enough difference in RV between the CRR group outcomes and the CRN group outcomes. Otherwise the covert reinforcement hypothesis cannot be tested. If none of the scenes are reinforcing then there should certainly be no difference between the treatment groups and the neutral reinforcement group which is to imagine a neutral scene. Likewise, the neutral scene group should be receiving scenes that have no reinforcement value. A pre-experimental procedure was used to validate the reinforcement value of the scenes. Subjects (not used in the experiment) rated written descriptions of the reinforcing scenes for reinforcement value and believability.

Other Variables. The scenes in this paradigm are presented immediately after the response to minimize delay of reinforcement. Also a variety of situations and reinforcing scenes are used to minimize satiation and maximize generalization. One other problem is that the time and number of conditioning trials is necessarily very small compared to the S's entire past history. Thus while some effect is predicted, it is expected to be small.

"Demand" Characteristics. Orne (1962) has described ways that the Ss may--in an attempt to help the experimenter--actually do things he would not ordinarily do, which invalidates the experiment. For example, if the S discovers the E's hypothesis, he is likely to try to help him prove it. One possible source of demand characteristics in this experiment was that members of control groups could realize that they were control subjects. This lower expectancy to change could cause their assertiveness to increase less than treatment groups. In the actual

experiment this was assessed somewhat by a post-experimental question. However, Orne has warned of a possible "pact-of-silence" even with these precautions. There is another possible source of demand differences. It could be that Ss in the CRR and CRN groups are given more information from the content of the scenes about specifically what the E is attempting to measure. It would then be easier to do what the E expects.

Non-Specific Treatment or Placebo Effects. Something about the extra attention, interest, or experimental nature of the situation may affect all treatment groups simply because Ss are being treated. This is different from the specific treatment effects hypothesized above. Therefore a placebo treatment group that is given attention and hopefully made to feel they are being helped is used. It is hypothesized that this type of group would improve less than treatment groups. Numerous investigators have stressed the importance of using placebo controls in applied intervention experiments. Actually this is the crucial control to see if effects specific to this treatment are obtained.

"Spontaneous" Improvement. It is possible that some general change could take place in many Ss' behavior that has not been caused by anything in the experimental situation. The placebo control is also a control for this type of confounding variable.

Summary of Hypotheses for the Actual Experiment

Questionnaire Responses. Questionnaires were used to assess Ss' verbal reports about how friendly-assertive they would be in the future. It was expected that covert rehearsal and reinforcement of friendly asser-

tive responses would have an effect of increasing Ss' expectations of how friendly they would behave in the future. Therefore it was expected that the Covert Rehearsal Reinforcement (CRR) group would report that they expected to be more extraverted on the Extraversion scale of Eysenck's (1969) Psychoticism, Extraversion, Neuroticism Scale than the other two groups. They should also score higher on a specially designed questionnaire called the Friendly Assertive Expectations Questionnaire.[1] It was also predicted that the effect of rehearsal plus some possible reinforcement would cause the CRN group to score higher than the P group. Finally it was expected that the combined CRR and CRN group would score higher than the P group.

A third questionnaire was also used. It is called the Attitude Survey and has one to nine ratings of pleasantness of various assertive responses. This test is designed to see if any attitude changes take place. It was expected that the responses themselves could become more positive due to their close relation to the reinforcement imagined in the scenes.

Amount of Talking. Subjects were run in pairs. The amount they talked to each other during testing sessions was measured before and after they listened to the treatment tapes. It was predicted that the CRR group subjects would show a larger increase in percentage of time talked than the CRN group, and that the CRN group would increase more than the P group. It was further predicted that the combined CRR and CRN group would change more than the P group.

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[1]See Chapter V for descriptions of these two tests.

CHAPTER V

METHOD

Pretest Instruments

Pretests were included primarily to help control for effects of individual differences. Subjects filled out a questionnaire asking for biographical information in addition to the tests to be described below. In pilot work several measures had moderate correlations with the dependent variables. These measures included sex, reported years in school, reported grade-point average, the Social Anxiety Scale, the Marlowe-Crowne Social Desireability Scale, the Friendly Assertive Expectation Questionnaire (FAE) pretest score, and question 18 of the FAE. These pretest measures were all included in the analysis of covariance performed on the questionnaire dependent variables. The last four of these measures will now be described.

Social Anxiety Questionnaire. A pretest was needed which would be easy to give and score and which would be correlated with talking to a stranger and correlated to the questionnaires which were to be used as dependent variables. Watson and Friend (1969) have reported that their Social Avoidance and Distress Scale (SAD) was a useful predictor of talking in an experiment which they performed. Furthermore, in pilot work the short form of this test was found to have moderate correlations with each of the questionnaires used as dependent variables (to be described below). The original test consisted of three scales--the 28 item SAD, the Fear of Negative Evaluation Scale, and the Marlowe-Crowne

Social Desireability Scale. Watson has since made a short, unpublished form which is much briefer. It consists of a 20 item Social Anxiety Scale version of the original SAD Scale and the 10 item Marlowe-Crowne Scale. Since time was an important factor, the shorter form was adopted.

The Marlowe-Crowne Social Desireability Scale was included in their questionnaire (Crowne & Marlowe, 1964). It was also found to correlate with questionnaires used as dependent variables in pilot work for this study. (For a copy of the Social Anxiety Questionnaire see Appendix D.)

Friendly Assertive Expectations Questionnaire (Short Form and Question 18). This questionnaire will be described more completely in the section below. The short form consisted of nine of the 18 items from the full form. One of these nine items was question 18. Question 18 was, "One year from today you will probably describe your past year's behavior as being (1) very shy, (2) shy, (3) average, (4) outgoing, or (5) very outgoing." In pilot work both the short form score and question 18 separately were found to correlate with questionnaire dependent variables. (For a copy of the short form of this test see Appendix D.)

Dependent Variables

Extraversion Scale of PEN. The 20 item Extraversion scale of Eysenck's Psychoticism, Extraversion, Neuroticism Questionnaire (PEN) was chosen because it is a brief, simple extraversion questionnaire that had some emperical support on its reliability as a test and as a factorially independent scale (see Eysenck & Eysenck, 1969 and Schulz, Miley, & Evans, 1972). (See Appendix D for a copy of the PEN Extraversion scale.)

Friendly Assertive Expectations Questionnaire. While the PEN seems to be a fairly good questionnaire, it is incomplete for the purposes of this study. It had too many items which were rather static descriptions of past or present behavior. It had too few items that explicitly asked subjects what they expected to do in the future. Also, many of its items were very general. Therefore the Friendly Assertive Expectations (FAE) Questionnaire was developed. The FAE consists of 18 items. Seventeen items begin with a description of a social situation and an eighteenth which is a global self-rating of shyness-outgoingness. Following the description of the situation are the descriptions of three to five alternative responses. Each choice is a description of a possible response the S can make to the situation. For example one question describes a scene in a store in which the subject sees someone he knows. Below the description are five alternative responses. One response is "say hello only if he sees you", another is "get his attention and say hello". Subjects are asked to pick the alternative most like how they will behave in the near future. Items are rated for "friendly assertiveness" and given different amounts of points in scoring. The total score is the sum of the scores on all items. It is to be emphasized that the FAE was designed primarily as a test to measure reported expectations not actual overt friendly behavior. Overt friendly behavior is measured by the amount of talking. (See Appendix D for a copy of the FAE.)

Attitude Survey. In order to see if any change in pleasantness of friendly assertive responses took place a very brief 10 item questionnaire was developed. Each item consists of the description of a

behavior such as "Starting a conversation with a stranger". Subjects are asked to rate this behavior in pleasantness on a one to nine scale of unpleasantness--pleasantness. (For a copy see Appendix D.)

Change in Percentage of Talking. There was a microphone attached to a cassette tape recorder hidden in the testing room. Tapes were made of each pair's conversation. In order to compensate for differences in the total amount of free time Ss had during the testing session (since some finished the written tests faster than others) ample time was left for all to finish. The last three minutes of the pretest session were checked in the same way. The change in percentage of talking is defined as the difference in the percentage of talking from the pretest check to the posttest check. The change score was used to help control for initial subject differences in their level of talking.

It might have been more ideal if the samples of time in which talking was measured would have began immediately following the instant both Ss were finished with the tests. That way there would have been less variation in the amount of time between the time the tests were completed and the sample began. The problem was that someone would have had to visually observe the Ss to see exactly when they finished. This was not practical. Instead Ss were given plenty of time to finish and the samples were taken later in the session. In addition they were requested to write down the time they finished. This was used as a check to see that the sample did not intrude into their test-taking time. In any case this lack of control would have only increased random error. There is no reason to believe that it

would have caused any systematic bias between treatment groups.

Posttest Debriefing Questions. A final questionnaire was given to the subjects regarding the experiment itself. There were two different, but similar versions. One version was administered to the CRR and CRN groups. It contained items on how helpful the treatment had been, how pleasant the scenes were, how pleasant the actual events would have been if they had really happened, how believable the scenes were, how clear the images were, how aware they were of the hidden microphone, whether they thought they were in a control group or not, and how well they knew the other S. The P group received a debriefing questionnaire with similar questions that fit the P procedure better. (For copies see Appendix F.)

Materials

Part of the experiment took place at the University of Hawaii and part at Whittier College. Three rooms were utilized--a testing room, an experimenter control room, and a training room. At the University of Hawaii the testing room was a classroom down the hall from the other two rooms. The investigator wanted a room that students would be unlikely to think would have a hidden microphone. Very few subjects reported that they thought there might be a hidden microphone. (A total of six out of 72 Ss for both schools answered the question that was designed to test for awareness affirmatively.) At Whittier a seminar room was used as the testing room. The training room at both schools was a small experiment room with a one-way mirror in it. Subjects sat at desks with a microphone and headphones on it. A barrier prevented them from seeing each other, so that they would have fewer

distractions while imagining the scenes. At Whittier a fan ran to help drown out any external noise. The experimenter control room was the room in which the experimenter spent most of his time. He was on the other side of the one-way mirror and could observe the Ss. An electronics system was built which enabled the experimenter to converse with either or both subjects through their headphones. A cassette recorder was connected to the system. The treatment tapes were played over this recorder.

Subjects

Subjects were 24 male and female college students from the University of Hawaii's second summer session and 48 male and female college students from Whittier College. At both schools Ss were recruited by class announcements telling of the general nature of the experiment. The presentation emphasized the knowledge the S might gain about psychological experiments. The aspect of getting Ss for a new treatment method for increasing friendly assertive behavior was also present to a mild degree. This announcement was consistent with the investigator's attempt to raise expectations to an equal degree among Ss of all treatment groups by telling them what they were being treated for instead of trying to hide it and taking the chance that some would discover it. Also, this made the treatment situation more like a clinical situation; although no Ss were intentionally recruited specifically because they had any problem.

Altogether 82 Ss started the experiment. The results of five pairs were deleted. One pair was dropped from the P group because one S

refused to go on. He said that he did not like some of the ideas which were expressed in the introductory rationale--they were too "Freudian". Two pairs were dropped because of tape recorder failure (one in the CRN and one in the P group). One pair in the CRN group was dropped because a S left before the E returned in the posttest situation, and one pair in the P group was dropped because the E accidentally returned too early in the posttest situation.

Design

There were three main treatment groups--the Covert Rehearsal Reinforcement (CRR) group, the Covert Rehearsal Neutral (CRN) group, and the Placebo Control (P) group. There were 12 pairs of Ss in each main treatment group. The groups were balanced for sex, school attended, and the high or low average Watson's Social Anxiety Questionnaire score for each pair. The high or low average score was determined by finding the average Social Anxiety score for each pair of subjects. If it was 12 or greater, they were considered a high Social Anxiety pair. If it was less than 12, they were considered a low Social Anxiety pair. Main treatment groups were balanced with respect to this Social Anxiety variable, but the number of high-scoring Ss did not equal the number of low-scoring Ss. Subjects were randomly assigned to groups within the constraints mentioned. They participated in the experiment in pairs. Each pair consisted of members of the same sex. They had been asked to sign up for the experiment that way.

An analysis of covariance design was used for the questionnaire variables. The variables of sex, grade point, year in college, Social Anxiety Scale score, Marlowe-Crowne Social Desireability Scale score,

question 18 of the FAE, pretest (short) FAE score, and percentage of pretest talking were used as covariates on each questionnaire data analysis.

However, the design for predicting change in percentage of talking was kept simpler--utilizing only the Social Anxiety score as a covariate. There were several reasons why the talk analysis was simpler. First, pilot work was inconclusive about what variables might have been useful covariates. Second, the talk scores were group scores, while the pretest scores were individualized scores. Finally, it was thought that using a change in talk score would be a good control for individual differences in talk rate.

Procedure

The E approached the pair of Ss seated in the hall. He then introduced himself and asked them to follow him to the testing room. Once in the room he asked them to be seated. Then he handed them the set of pretest questionnaires and asked them to fill them out. He asked them to use the clock provided to write down the exact time they began and the exact time they finished. The last sheet in the test booklet also reminded them of this. The time they recorded as having finished served as a check later on to make sure subjects did not work into the time established as a time to measure their talking. The E then told the S that he would return in exactly 17 minutes at whatever time that would be on the clock. He then left. When the E returned he collected the questionnaires and asked the subjects to follow him into the next room. When they arrived in the treatment room, the E asked the Ss to be seated and try on the headphones on the desks in front of them.

He then said,

> This (pointing at the mirror) is a one-way mirror. I will be on the other side of this one-way mirror. I will be able to see you, but you won't be able to see me. I will be playing a prerecorded tape that you will be able to listen to through the headphones. If at anytime during the experiment you have any questions, please wave at me and I will talk to you through the headphones. You may talk to me through the microphone in front of you. The instructions will be on the tape. Do you have any questions?

The E then went into the control room. He quickly scored the Ss' SAD questionnaires. Then he checked the overall assignment sheet to make sure that none of the experiment design assignment categories were filled. Using slips drawn from a box he then assigned the Ss to the unfilled group that was drawn first. Categories were filled in two stages to prevent long chance runs in any one category. Then he played the cassette with the prerecorded treatment selected.

The only difference in the treatment of the three main groups was in the tape that they listened to. These tapes will now be described. For a more complete description see Appendix A and Appendix B. The CRR and CRN group tapes were identical except for the scene endings (the response of the stranger whom the S imagines himself talking to). The introduction was identical for all three groups. It follows:

> This is an experiment to test a method for helping people become more friendly, outgoing, and assertive. If you think that you would prefer not to become more friendly and out-going, please wave at the experimenter now and you can drop out of the experiment and still receive full credit for it. You may drop out of the experiment at any other time, but we prefer that you make your decision now if possible.
>
> Subject on your left, how is the volume level. Please tell the experimenter how it is now. (pause) Testing, testing, testing. Is that better? (This is repeated for the other subject.)

Thus all Ss were told that this was a treatment method to help them become more outgoing. It was hoped that any Ss who might not take the situation seriously would drop out. Only one subject dropped out during the tape. He dropped out during the Placebo tape. That pair was voided.

Following that introduction the treatment rationale was given. The rationale was identical for the CRR and CRN groups. It follows:

> You will hear the descriptions of various scenes and be asked to imagine that the events described are actually happening to you. Then you will be asked to imagine yourself making certain responses. This is called covert behavior rehearsal, because you practice making certain responses in your imagination. The responses that you will practice are examples of friendly and assertive responses that you could make in that particular situation. This experiment is designed to find out if imagining yourself being more friendly and assertive can help you actually be more friendly and assertive.
>
> This covert behavior rehearsal method is still relatively new. However, there is reason to believe that it can be useful in helping people change their behavior.

A similar treatment rationale was written which better fits the P tape. It follows:

> You will be given a short introduction to some theory which will help you understand yourself better. Then you will be given a series of questions about yourself. You will be asked to think about these questions. From analyzing yourself using some of the theory in relation to these questions it is hoped that you will get more insight into your personality in general so that you may become more friendly and assertive. This method of treatment is called "guided self-exploration". The theory is a combination of insights from Freudian and Humanistic Psychology. The guided self-exploration method is still relatively new. However, there is reason to believe that it can be useful in helping people change their behavior.

Following the treatment rationale were the general instructions. The instructions for the CRR and CRN groups follow:

> I will describe a scene to you. I would like for you to try to imagine yourself as actually being in the scene. Please try to do this even if for some reason it doesn't actually fit your life situation. Please try to relax and just let yourself by guided through the scenes. Whenever you have a fairly clear image and are following pretty well, please raise your right index finger. Keep it raised as long as you have a clear image of the scene. The experimenter will see it through the one-way mirror. If you lower it, the experimenter will try to help you. If you have a great deal of difficulty imagining any scene, please tell the experimenter now. (pause)
>
> It is very important that you actively imagine yourself in the situation--living it as if it is happening right now. Don't just listen to my voice, but actively fill in the blanks and details that I leave out. For example if I say something like, "Imagine that you introduce yourself", don't just listen to my words, but imagine yourself actually saying to the person in the scene, "Hi, I'm John Doe."
>
> If you have no more questions, let's try a practice scene. Please just make yourself confortable in your chair, close your eyes, listen to my voice, and try to imagine yourself in the setting I am about to describe.

The Placebo group received general instructions that were identical to the covert rehearsal groups except that the first sentence was replaced by the statement, "In order to help you get the feel of clearly imagining some of your life events, I will first ask you to practice imagining a scene I shall describe." This statement had the effect of limiting the instructions to the practice scene and fitting it into the placebo treatment better.

The scene which was then described depicted the S standing in line at the cash register of a grocery store. Following the description were some questions about the clarity of the S's image. If he failed to imagine it clearly enough, that pair was to be dropped from the experiment. Richardson (1969) has reported that many subjects

have difficulty generating clear images of such scenes. However, not one S reported persistant difficulty in imagining the scene.

Following the questions about the clarity of the practice scene the CRR and CRN Ss received instructions asking them to imagine a series of eight scenes. They had two breaks--one after the third and one after the sixth scene. Each break lasted about a minute and a half. The situation and response part of the scenes was identical for the two covert rehearsal groups. In each scene the Ss were asked to imagine themselves in some social situation, then asked to imagine themselves initiating a friendly conversation with the person described in the scene. The person was always of the same sex as the Ss. Thus one male and one female prerecorded tape were required for each of the CRR and CRN conditions. For example in one scene the Ss were asked to imagine themselves sitting in one of their classrooms. Then they were asked to imagine another student sitting near them. The response consisted of instructions to imagine themselves introducing themselves to the other student. The only difference in the CRR and CRN groups was in the scene's ending. The CRR group Ss were asked to imagine the other student being very friendly in return and to imagine themselves feeling good. The CRN group Ss were asked to imagine a rather short, almost businesslike response by the other student. (See appendix A and appendix B for complete descriptions of the scenes.)

During the time that the Covert Rehearsal groups' tapes contained instructions to imagine scenes, the P group tape contained a brief lecture on the Id, Ego, and Superego and some instructions asking subjects to think about some questions. The Placebo Ss were asked to think about

some characteristics of their mother and father and their relationship to their parents. There were also questions asking them to think about how creative, impulsive, etc. they are. (See Appendix C for a complete description of the lecture and questions.)

The final part of the CRR and CRN group tape included the following instructions.

> These scenes have been presented to help you become more self-assertive or outgoing in a friendly manner. They can help, but it is also important that you do three things to assure their effectiveness. First, practice imagining the scenes. You can practice while alone someplace, or you can practice imagining in the actual setting where you want to be more friendly.
>
> The second and most important thing to do is to practice actually being more friendly and assertive to people whenever you have the chance. This is the crucial part of the method--it is up to you.
>
> Finally, please do not discuss what happened in the experiment itself with anyone until we tell you. This is very important to the experiment. Thank you very much for your cooperation. I hope you have found this experience interesting.

The P group tape contained a similar ending. The only difference is that in the first paragraph references to the scenes are changed to refer to the questions the Ss were asked to think about. The last two paragraphs were identical to the covert rehearsal groups.

Then the E returned to the treatment room and asked the Ss to follow him into the testing room again. There he gave them the post-test questionnaires with instructions almost identical to the pretest instructions except that Ss were given 20 minutes. Again they were instructed to record the time they began and the time they ended. The E then left the room.

Twenty minutes later the E returned and took the questionnaires. Then he handed the Ss the appropriate debriefing questionnaire, and asked them to fill it out. When they finished he questioned them further. Then he told them about the hidden measure and the nature of the experiment. He answered their questions fully and honestly. He told Ss in the P group that they were control subjects and gave them the opportunity to listen to the treatment tape at their convenience. Finally he cautioned them about talking about the experiment to anyone.

The entire experimental procedure took about 85 minutes for each treatment group. The pretest took about 18 minutes, the tape session about 42 minutes, and the posttest about 21 minutes. In addition the debriefing took from 5 to 10 minutes.

CHAPTER VI

RESULTS

The most important results related directly to the experimental hypotheses. The hypotheses were essentially the same for each questionnaire and talk dependent variable. The general experimental hypothesis predicted a main effect due to the treatment instructions. To test this an overall analysis of covariance was first performed.

Two more specific hypotheses were very important. The covert reinforcement hypothesis predicted that the Covert Rehearsal-Reinforcement (CRR) group would score higher on questionnaire and talk measures than the Covert Rehearsal-Neutral (CRN) group. To test this hypothesis a Scheffe post-hoc comparison test was performed if the overall effect was significant (see Myers, 1967). The covert rehearsal hypothesis predicted that the pooled CRR-CRN group would score higher than the Placebo (P) group. To test this hypothesis the pooled CRR-CRN adjusted mean was compared to the P group mean using the Scheffe post-hoc test if the overall effect was significant (see Myers, 1967).

The results relevant to these and other hypotheses will be discussed for each general type of dependent variable. There were three types of dependent variables--questionnaire measures, a talking measure, and debriefing questions.

Questionnaire Results

Three questionnaires were used as dependent variables--the Friendly Assertive Expectations Questionnaire, the PEN Extraversion Scale, and the Attitude Survey. An analysis of covariance using eight pretest

measures as covariates was performed on each of the three questionnaires (cf. Dixon, 1971). The pretest measures were sex, reported years in school, reported grade-point average, Social Anxiety Questionnaire (SAD) score, Marlowe-Crowne Social Desireability scale score (MC), question 18 of the FAE, the FAE pretest (short form) score, and the pretest percentage of talking.

The reason that these covariates were included in the analysis is that moderate correlations with the posttest questionnaire scores had been found for seven of the variables during pilot work. The talk score had not been included in the pilot work analysis; however it was decided to use it as a covariate also.

In order to test the assumption that the covariates were not related to the assignment of subjects to treatment groups, a preliminary analysis was performed. The preliminary analysis showed that the three treatment groups (CRR, CRN, P) were not significantly different with respect to any of the eight pretest measures which were used as covariates.

After the overall analysis of covariance was completed on each questionnaire variable, Scheffe post-hoc comparisons analyses were performed on adjusted means to test more specific hypotheses such as the covert reinforcement hypothesis and the covert rehearsal hypothesis. The results for each of the questionnaires will now be presented.

Friendly-Assertive Expectations Questionnaire

Since one of the pretest measures used was the FAE short form, two separate FAE dependent variables were used. The first was a difference score. The second was a simple full scale score. For both

tests an analysis of covariance was performed using the variates sex, GPA, years in college, Social Anxiety test score, the Marlowe-Crowne Social Desireability score, question 18 of the FAE, the FAE pretest score, and the percentage of pretalk score (% pretalk).

Table 1

Means and Standard Deviations for Questionnaire,

Talking, and Debriefing Variables

Dependent Variable	Group	Mean	S. D.	Adjusted Mean[a]
FAE Change	CRR	0.58	3.41	0.97
	CRN	2.08	2.52	1.69
	P	0.79	1.93	0.80
FAE (Full)	CRR	61.46	7.03	60.96
	CRN	61.26	6.26	62.33
	P	58.63	9.47	58.05
PEN Extraversion	CRR	13.08	4.18	13.11
	CRN	14.33	3.71	14.53
	P	11.92	3.32	11.70
Attitude Survey	CRR	50.33	8.90	50.23
	CRN	51.00	9.01	51.00
	P	48.04	9.95	48.04
Talk Change	CRR	0.145	0.388	0.145
	CRN	0.291	0.280	0.286
	P	-0.050	0.228	-0.045
How Helpful? (1-5)	CRR	3.17	0.96	
	CRN	3.04	1.06	
	P	2.62	1.09	
How Pleasant Listening? (1-9)	CRR	5.46	1.61	
	CRN	5.67	1.70	
	P	5.00	2.06	
How Pleasant Endings? (1-9)	CRR	7.13	1.42	
	CRN	6.00	1.82	
How Believeable? (1-5)	CRR	3.63	1.13	
	CRN	4.17	1.27	
How Clear Images? (1-5)	CRR	3.96	0.80	
	CRN	4.17	0.63	
Imagine extra details? (1-5)	CRR	4.29	0.69	
	CRN	4.04	0.88	

[a]Adjusted means are the means resulting from subtracting effects due to the covariates in the analysis of covariance.

FAE Change Score. The FAE change score was defined as the posttest short form FAE score minus the pretest FAE short form score. The two tests were identical. The FAE change variable thus was a measure of change in response for the same items. The adjusted means (from Table 1) were CRR=.97, CRN=1.69, and P=.80. There was not a significant overall treatment effect. Therefore no further analysis was performed. See Table 2 for a summary of the analysis.[2]

Table 2

Analysis of Covariance of FAE Change Scores

Source	SS	df	MS	F
Total(adj)	304.90	63		
Error(adj)	296.23	61	4.856	
Treatment(adj)	8.68	2	4.339	0.894 n.s.

n.s. p greater than .05

FAE Full Scale. The posttest full scale FAE included all 18 items, nine of which had not been given to the Ss before. There was an overall treatment effect (p less than .01). See Tables 1 and 3. The full scale FAE adjusted means looked a little more as expected (CRR=60.96, CRN=62.33, P=58.05). It may seem strange that there was no significant difference in the FAE change score for nine items while there was a significant FAE posttest difference for the full test. During the experiment, several Ss volunteered that they had consciously attempted to answer items the same from pretest to posttest in case the E was

[2] If the overall analysis of covariance resulted in p less than .05, then the Scheffe post-hoc comparisons tests (cf. Myers, 1967) were performed to compare CRR, CRN, and P differences in adjusted means. If p was greater than .05, then no post-hoc comparisons were made.

testing to see if their answers were consistent. Other Ss may have automatically answered items the same way as the first time to keep from having to re-read the whole item. This tendency toward consistency could effect FAE change scores severely, but could have less of an effect on the full FAE in which half of the items were given only once.

Table 3

Analysis of FAE (full scale) Post Test

Source	SS	df	MS	F
Total(adj)	1203.78	63		
Error(adj)	1008.05	61	16.525	
Treatment(adj)	195.73	2	97.865	5.922**

**p less than .01

Three posthoc comparisons were made using the adjusted means. It was found that the pooled CRR and CRN group mean was significantly greater than the P group mean (F=12.54; df 2,61; p less than .05). In addition each of the covert rehearsal groups was individually greater than the P group mean (for CRR vs. P, F=6.18; df 2,61; p less than .10; and for CRN vs. P, F=13.34; df 2,61; p less than .01. There was no difference between the CRR and CRN group means (F=1.38; df 2,61; p greater than .10).[3]

[3]For each Scheffe comparison it was appropriate to use an F test which tested for the possibility that any comparison out of all possible comparisons is significant. The appropriate F is (a-1) $F_{df1,df2}$ at p less than .10. The reason a number of authors suggest using the .10 level instead of the traditional .05 level is that the F is for all comparisons experimentwise. The alpha for any individual comparison would be considerably less than .10 (see Hays, 1963; Morrison, 1967; Myers, 1966; and Scheffe, 1959).

PEN Extraversion Scale

An analysis of covariance was performed on the PEN Extraversion variable using as covariates: sex, GPA, years college, Social Anxiety, Marlowe-Crowne, question 18, FAE pretest, and % talk. A significant overall treatment effect was found (*p* less than .01) between the adjusted means of CRR=13.11, CRN=14.53, and P=11.70 as shown in Table 1. The summary of the analysis is given in Table 4.

Table 4

Analysis of PEN Extraversion Scale

Source	SS	*df*	MS	*F*
Total(adj)	505.23	63		
Error(adj)	425.25	61	6.971	
Treatment(adj)	79.98	2	39.990	5.736**

**p less than .01

The Scheffe test was performed on the adjusted means, and a pattern similar to the one for the FAE was found for the posthoc comparisons. The pooled covert rehearsal group (CRR plus CRN) mean was significantly greater than the P group mean (*F*=4.86; *df* 2,61; *p* less than .10). However, the only significant pairwise comparison was that the CRN group mean was significantly greater than the P group mean (*F*=10.00; *df* 2,61; *p* less than .01). Neither the CRR vs. CRN comparison (*F*=3.47; *df* 2,61; *p* greater than .10) nor the CRR vs. P comparison (*F*=3.40; *df* 2,61; *p* greater than .10) was significant.

Attitude Survey

An analysis of covariance was performed on the Attitude Survey Scale using the same eight covariates: sex, GPA, years college, Social

Anxiety, Marlowe-Crowne, question 18, FAE pretest, and % pretalk. The adjusted means from Table 1 were CRR=50.23, CRN=51.00, and P=48.04. However, main treatment effect was not significant (see Table 5). Therefore no post-hoc comparisons were made.

Table 5

Analysis of Attitude Survey

Source	SS	df	MS	F
Total(adj)	3451.49	63		
Error(adj)	3299.47	61	54.090	
Treatment(adj)	152.02	2	76.009	1.405[n.s.]

[n.s.] p greater than .05

Change in Percentage of Talk

There had been insufficient pilot work to establish which covariates would be most useful in predicting the amount of talking. However, Watson and Friend (1969) presented evidence that their Social Avoidance of Distress scale was a good predictor of individual differences in talking. Therefore Watson's shorter version, the Social Anxiety Scale, was used as a covariate for the change in percentage of talk from the pretest situation to the posttest situation. No other covariates were used in the analysis of covariance. The adjusted means (from Table 1) were CRR=.145, CRN=.286, and P=-.045. There was a main treatment effect as shown in the summary in Table 6.

Table 6

Analysis of Talk Change

Source	SS	df	MS	F
Total(adj)	3.701	34		
Error(adj)	2.998	32	0.0937	
Treatment(adj)	.703	2	0.03512	3.74*

*p less than .05

The Scheffe test was performed on the adjusted means for all four comparisons. The pooled CRR-CRN group mean was significantly greater than the P group mean (F=5.79; df 2,32; p less than .10). The CRR and CRN groups did not differ significantly (F=1.28; df 2,32; p greater than .10), nor did the CRR and P groups (F=2.30; df 2,32; p greater than .10). However, the CRN group mean was significantly greater than the P group mean (F=7.02; df 2,32; p less than .05).

In order to check for possible initial group differences in amount of talking, an overall F test was performed using the pretest percentage of talking as the dependent variable. The initial differences were not significant.

Debriefing Questions

Several debriefing questions were included in the analysis. Some were included to find out whether some other possible explanations which are contradictory with the main hypotheses would be supported or not by this additional data. Others were included which tested main assumptions of the experimental procedure.

Helpfulness

First, it was important to find out if something about one treatment procedure or another had anything about it which might generally

increase Ss' expectations of improving. This general expectations effect might be similar to the "experimenter bias" or "demand characteristics" effects discussed earlier. Thus the question, "How helpful do you think this experiment was in helping you to become more friendly and assertive in the future?" was included. Subjects were presented with a simple scale of one to five from "not very helpful" to "very helpful". Means were CRR=3.17, CRN=3.04, and P=2.62 (see Table 1). A one-way analysis of variance test revealed no significant treatment effect on Ss'reply to this question (see Table 7).

Table 7

Debriefing Question 2: Helpfulness of the Procedure

Source	SS	df	MS	F
Total	75.760			
Error	71.898	69	1.042	
Treatment	3.862	2	1.931	$1.85^{n.s.}$

$^{n.s.}$ p greater than .05

General Pleasantness of the Tape

One question was included to see if the tapes differed in pleasure or interest value. Subjects were asked to rate pleasantness from highly unpleasant (1) to highly pleasant (9). Means were CRR=5.46, CRN=5.67, and P=5.00 (see Table 1). Again a simple analysis of variance revealed no significant effect (see Table 8).

Table 8

Debriefing Question 3: Pleasantness of Listening

Source	SS	df	MS	F
Total	218.285			
Error	216.591	69	3.139	
Treatment	1.694	2	0.847	0.27[n.s.]

[n.s.] p greater than .05

Pleasantness of Scene Outcomes

A fundamentally important question concerns the relative reinforcement value of the endings of the CRR and CRN scenes. It was assumed that the CRR scenes were more reinforcing. In a pilot study, college students in a psychology class were given very brief written descriptions of the situation and response part of the scenes and verbatum descriptions of the outcomes of the scenes. They were asked to rate them on a scale ranging from "highly unpleasant" (1), to "neutral" (5), to "highly pleasant" (9). For every scene, the two-tail t test was significant in the expected direction at p less than .01 or better. It was largely on the basis of these means that the investigator had felt justified in using the labels "reinforcing" scenes and "neutral" scenes in relation to the CRR and CRN groups, respectively.

The Ss in the CRR and CRN groups of this experiment independently rated the scenes for pleasantness in their response to the question, "On the average, how pleasant would it have been if the events described in the scenes had really happened to you (especially the last half of the scenes)?" They used the same one-to-nine rating scale.

The means were 7.13 and 6.00 for the CRR and CRN groups, respectively and were significantly different (using a two-tail *t* test, *p* less than .05).

Thus data from the two studies were consistent in supporting the assumption that the scene outcomes were more pleasant for the CRR group than the CRN group.

Believability of the Scenes

It was assumed that the believability of the CRR and CRN outcomes needed to be similar or else believability might account for any differences in the group means. Thus in both the scene rating study mentioned in the last section and this experiment, believability ratings were included. Subjects were asked to rate believability on a scale from "unbelievable" (1) to "highly believable" (5). In the former study, believability means were not significantly different when all scenes were compared using an overall *F* test for the analysis of variance. In the present study, the debriefing question, "On the average, how believable did the scenes seem for you personally?" was included. Subjects were asked to rate believability on the same one-to-five scale. Means were 3.63 and 4.17 for the CRR and CRN groups, respectively. They were not significantly different (two-tail *t* test).

Therefore, again both sets of data were consistent in supporting the assumption that the believability of the CRR scenes was not different from that of the CRN scenes. Also, *S*s in each study rated the believability of the scenes rather high. The overall mean was 4.06 out of 5 possible for this study. That could be important for achiev-

ing any effect for the covert rehearsal.

Clarity and Activeness of Images

Two questions were included on the clarity of the images for the CRR and CRN groups. Subjects rated the clarity of the images from "very unreal and unclear" (1), to "very real and clear" (5) to the question, "How real or clear did the scenes seem to you as you were imagining them? Did you feel like you were actually in them?" The means were 3.96 and 4.17 for the CRR and CRN groups. The difference was not significant (two-tail *t* test).

The question, "To what extent did you fill in the blanks and imagine additional details and words as asked by the narrator?" was included to provide a check on how actively Ss imagined the scenes. A five-point rating scale ranging from "not at all" (1), to "almost all the time" (5) was provided. Means were 4.29 and 4.04 for the CRR and CRN groups respectively. The difference was not significant (two-tail *t* test).

From the absolute value of the means to both of these questions, plus the lack of difficulty expressed by Ss during the practice scene, it appears that Ss were able to form fairly clear images. At least they consistently reported that they were able to.

Awareness of Artificial Aspects of the Experiment

Of course all Ss were aware that they were participating in an experiment. There were two aspects of the experiment for which it was important to maintain low awareness. The first was awareness of the hidden observation of their talking. Five questions were included to measure this. Only three Ss in the CRR, only one in the CRN, and two

in the P group expressed awareness in the questionnaire. Three or four additional Ss said they had wondered if they were being recorded. However, they did not say this until after they were told about the recording.

The other important hidden aspect was including a condition (P) which was not expected to have much effect. Yet it was important that Ss not be aware of the E's expectation. Special precautions discussed above were taken to reduce this possibility. There were two measures of the effectiveness of these precautions. The first was the question on the perceived helpfulness of the method discussed above. The second was a direct question about whether Ss thought they were in a control group or not. Only one S in the CRN group and one in the P group said they did. None in the CRR thought so. Thus, Ss expressed low awareness of being in a control group.

CHAPTER VII

DISCUSSION

A particular methodology was used in designing and implementing this experiment. The investigator began with an abstract principle (instrumental conditioning) which had been well-established for the conditioning of overt behavior and applied it to predict behavior using covert rehearsal and covert reinforcement instructions. The assumption underlying these predictions was that covert instrumental conditioning took place with resultant generalization to overt behavior. There was no direct test of this assumption in this experiment. However, hypotheses deduced from this covert instrumental conditioning assumption were tested.

Discussion of the Covert Reinforcement Results

The Covert Rehearsal Reinforcement Outcome (CRR) group, which was asked to imagine positive outcomes, did not score significantly different from the Covert Rehearsal Neutral Outcome (CRN) group, which was asked to imagine neutral outcomes on any of the questionnaire variables or on the change in talking variable. Therefore, the hypothesis that a difference in covert reinforcement instructions will change overt questionnaire and talking responses was not supported. Since no effect was found, one does not have to look for variables to explain this. This evidence does not disprove the covert reinforcement hypothesis, since it is possible that the experiment did not properly test the hypothesis. It is also possible that the difference in covert reinforcement between (the CRR and CRN) treatment groups was too small to adequately test the hypothesis. Perhaps later experiments should

try to create larger differences in covert reinforcement and see if that makes a difference.

Nevertheless, student ratings did show a difference in rated pleasantness between the reinforcements. One might also question the relationship between rated pleasantness and reinforcement value, but at this point it seems simpliest to assume that the experiment was a fair test of the hypothesis and failed to support it.

Other evidence related to the covert reinforcement hypothesis has been reviewed in an earlier section. There were many experiments and case studies in which investigators used "covert reinforcement procedures". Among those found in the literature there was a strong trend towards finding positive results using these procedures. However, while there was evidence that the covert reinforcement procedure worked better than no treatment or some sort of placebo treatment, there was little evidence that the covert reinforcement instructions _per se_ was an important part of the treatment or that the _Ss_ changed because they were receiving covert reinforcement. In a number of studies there were no controls. In every other study, except one, the investigator failed to control for the effect of social reinforcement provided directly by the therapist or experimenter. Only Cautela, Steffan, and Wish (reported by Cautela, 1970) used a proper control group in which _Ss_ were treated identically except that one group was asked to imagine positive scenes and the other neutral scenes as reinforcements. They found a positive result.

Thus when the evidence concerning the value of covert reinforcement instructions is examined very carefully the evidence that is left is that

Cautela *et al*'s experiment supports it and this one fails to support it. It is not clear why there were differences in the results of these two experiments. There were differences in procedures. Cautela used unrelated reinforcers for circle over- or underestimation. In the present experiment related reinforcers were given for imagined talking. Their response was an overt response requiring no response generalization; the one in this experiment was a covert response requiring response generalization. Perhaps other experiments should be performed to find out if one of these variables associated with procedural differences may have interacted with covert reinforcement to explain the differences in results of the two experiments.

In general then the evidence related to the covert reinforcement instructions hypothesis is insufficient. Certainly one cannot conclude at this point either that the evidence supports the hypothesis or that it fails to support it. There is too little evidence and too many unanswered questions.

Some Possible Explanations of the Covert Rehearsal Results

A second hypothesis under consideration was the covert rehearsal hypothesis that *S*s imagining themselves speaking to strangers would change in their verbal reports about their speaking to strangers and change in the amount they actually spoke to strangers. In general there were significant differences between the pooled CRR and CRN group and the Placebo (P) group on both questionnaire and change in talking scores. Thus at least superficially the results were in line with the prediction.

However, there are an infinite number of hypotheses that can be used to explain the general finding that the covert rehearsal groups showed greater changes in expectations and overt behavior than the placebo control group. Although, the fact that the covert rehearsal hypothesis was used to predict this result in advance adds corroborating evidence for the covert rehearsal hypothesis (Popper, 1934).

The covert rehearsal hypothesis needs further discussion, however. First, the effect of covert reinforcement cannot be ruled out altogether as a cause of the covert rehearsal effect even though the explicit prediction based upon it (that CRR Ss would change more than CRN Ss) was not supported. First, it is possible that Ss received covert reinforcement in both CRR and CRN groups, but that there was not enough difference between them to make a measurable difference in the dependent variables. Subjects in both groups rated the outcomes as pleasant (means were CRR=7.13, CRN=6.00 on a one to nine scale). In addition, several Ss in the CRN group spontaneously expressed pleasure about the thought of having performed the response. There may also have been an intrinsic reinforcing effect due to imagining oneself performing the assertive response which was present in both covert rehearsal groups. It is also possible that there may have been a ceiling effect of reinforcement due to intrinsic reinforcement. To better test the efficacy of differences in covert reinforcement instructions, one might use a less pleasant response. This intrinsic reinforcement hypothesis may explain why Cautela (1970 and 1971a) reported effects of covert reinforcement when the response was over or underestimating the size of circles while this investigator found no difference on what may have

been a more intrinsically reinforcing response. Possibly there was a "ceiling effect" due to some intrinsic reinforcement from imagining the response in the present experiment, but not present in Cautela's. For, it is hard to imagine that underestimating or overestimating the sizes of circles would be reinforcing. Therefore, the covert extrinsic reinforcement may have provided a sizeable increase in reinforcement for Cautela's, but not for these CRR Ss.

There are a number of hypotheses which in effect say that covert reinforcement was not important, but that some other variable can account for the lack of difference between the CRR and CRN groups and the difference between these and the P group. One hypothesis which might help explain the differences between the covert rehearsal and placebo group results is an increase in the Ss' skill to respond when meeting a stranger. The Ss were given some guidance about what to say and do. Possibly these instructions increased their knowledge about what to do when meeting a stranger. There is no evidence in the experiment which tests either the reinforcement-of-both-groups hypothesis or the increase-in-skill hypothesis. This explaination would also be consistent with a social behaviorist type theory such as that favored by Staats or this investigator.

Another explaination might be that there is a desensitization type effect taking place which is different than the covert instrumental conditioning presumed to be occurring. This may be equivalent to saying that the classical conditioning principle can be used to explain the results better. This is a possibility, but the experiment was designed to fit a covert instrumental conditioning paradigm. (For some of

the difficulties in differentiating between covert classical and instrumental conditioning see the discussion in Chapter III.)

There are two "expectations" type hypotheses which may account for the observed differences. The first is the "demand" hypothesis (see Orne, 1962). This hypothesis states that Ss discover what the E is doing and attempt to help him by behaving as they think he expects them to. They may even keep quiet about what they did when asked by the E later on so he will feel that everything in his experiment was well done.

The second "expectations" hypothesis states that there may have been a difference in treatment which changed Ss' general expectations about how good a treatment they were getting. There may have been an "experimenter bias" effect (see Rosenthal, 1964). This means that the E's expectation that one treatment is more effective could cause the Ss to behave differently if it was subtly communicated to them, or if he favored one group in other ways extraneous to the experimental hypothesis.

There were a number of precautions taken to minimize differences in both demand and experimenter bias-type expectation effects. These included taping instructions, standardizing treatment procedures rigidly, minimizing experimenter-subject interactions, not choosing which group Ss were to be run in until the last possible moment, designing a placebo treatment which seemed very real to the Ss, and emphasizing to all Ss that it was hoped their treatment would make a change in their friendliness. In addition, debriefing questions were included to measure differences in Ss' reported expectations about the "helpfulness" of the

method, whether or not they were in a control group, and how pleasant it was listening to the tape. There were no significant differences between groups on responses to any of these questions. Therefore the debriefing data did not support these "expectations" hypotheses.

There is also a more subtle form of the experimenter bias hypothesis which may explain the results. It is that Ss in the covert rehearsal groups were able to tell from the descriptions of the scenes what the E was looking for. Since the P group members did not receive as much of this kind of specific information, it may be that this difference in information could account for the results. This is similar to the increase in skills hypothesis above. The difference is that in the former case the Ss would be doing it because of an increase in skill per se, while in this case they would be doing it because they better knew what the E wanted them to do. There is no evidence that bears directly upon this issue. However, there was no significant difference in reported awareness of being tape-recorded between groups. One might expect a difference if covert rehearsal Ss somehow better knew what the E was looking for. This hypothesis cannot be ruled out as a possible explanation, however.

Another hypothesis could be called the placebo decrement hypothesis. It is possible that the covert rehearsal procedures had no effect upon the Ss natural questionnaire response or talking habits at all. It could simply be that the placebo treatment had some kind of a detrimental effect upon the Ss' natural habits. Even though there was not a significant absolute decrement in P group performance, there may have been a difference relative to their natural habits. Given this type of an

experimental situation this type of hypothesis would be very difficult to falsify. The reason is that it is difficult to operationally define the term "natural situation" convincingly. One could argue that a "no treatment" control could have been used in addition to the placebo control. However, one problem in this situation lies in the length of time between the pretest and the posttest situation. The time interval was 42 minutes. What "no treatment" could have been given that would convince others that it could not possibly have had a detrimental effect on Ss' normal questionnaire answering and talking habits? Were they to read for the 42 minutes, talk, sit alone doing "nothing", or what? Instead, the author used a placebo treatment which should have increased the Ss' expectations that they would change a little, at least. In the literature placebo groups have consistently had effects at least equal to "no treatment" groups and usually they have had greater effects (cf. Paul, 1969). It appears that in fact the major question should be whether or not there is a difference between the treatment and placebo groups. This question is more important because it asks whether or not there is any effect due specifically to the experimental treatment that is not found to be an effect of all or most treatments. In this case the evidence supported the hypothesis that there was a specific covert rehearsal treatment effect.

There may have been other differences between the covert rehearsal and placebo tapes which may have caused the differences in effects. For example the narrator talked more on the covert rehearsal tapes. Also, there were two one and one-half minute breaks on the covert rehearsal tapes that were not present on the placebo tape. Subjects could have

interacted during these times. However, only one or two pairs did. In order to interact it was necessary to go around the barrier separating them. The placebo Ss were not specifically given breaks. However, they had more time with no talking, so it was felt that these "thought" periods served as breaks. Any of these differences and possibly others could have caused the observed effects. However, this problem exists whenever a placebo type control is used. The solution to this problem may come only after there is more information about exactly which variables it is important to control.

Another possible explanation of the results is that something else about the taped instructions caused the differences, but that true covert rehearsal had nothing to do with it. Of course this is possible. However, there is at least evidence that the Ss reported they were imagining the scenes clearly and actively adding details, which is the operational definition of covert rehearsal in this study.

Despite the possibility that some "expectation" type hypothesis or some other hypothesis might account for the consistent differences between pooled covert rehearsal and P groups, the analysis of the procedure used and the debriefing answers generally do not support them. In addition the experimental hypotheses were stated in advance. Therefore, it can be concluded that the results supported the hypothesis that something inherent in the covert rehearsal of the scenes caused the observed differences in Ss' questionnaire responses and increases in talking to each other.

Explanations Specific to Questionnaire Results

An elaborate theory has been presented in earlier chapters concern-

ing the application of conditioning principles to covert behavior. One might ask how this is relevant to explaining the results specific to the questionnaire results.

The FAE Questionnaire provided the most straightforward test of Ss' verbal reports of how friendly they expected to act in a number of situations. The test was designed only to measure their verbal report of their expectations, not to predict actual behavior in those situations or to measure some trait. Results showed a positive effect for the covert rehearsal treatment (CRR, CRN vs. P), but not for the covert reinforcement treatment (CRR vs CRN).

The theory presented earlier assumed that S-R habits, including complex response systems, would be changed by covert conditioning procedures. It was hypothesized that the response of imagining oneself being friendly would be more likely when the S either imagined himself being with a stranger or was actually with a stranger. It was expected that this change in imagining oneself being more friendly would effect Ss' verbal reports of how friendly they expected to be in the future. The hypothesis that covert reinforcement had an effect on frequency of covert behavior did not receive any indirect support from the FAE results. However, the hypothesis that covert rehearsal affected the probability of the covert response received some very indirect support. That indirect support lies only in the fact that a deduction of this hypothesis was supported (ie. Ss reports of expectations changed as predicted). However, one might relate this hypothesis to the Mahoney, Thorensen, and Danaher (1972) experiment discussed earlier. They used an external

reinforcer which apparently increased the response rate of a covert response. Their experiment was a much more direct test of this hypothesis.

The PEN Extraversion scale consisted of items that were designed to measure a "trait" of extraversion (Eysenck, 1969). A trait theorist might then wonder if the effect of the covert rehearsal was due to the test being affected by influences other than traits. He also might wonder if the test measured a true change in the trait. In that case the results might provide insight into how traits are learned. Either of the explanations would be plausible from the point of view of trait theory. However, the conditioning theory presented here made no mention of traits. Instead the theory assumed that S-R habits would be changed by covert conditioning instructions. In Chapter Four there was an explanation about how complex symbolic responses could serve as expectations, and how these expectations might be affected by conditioning. It is assumed that these covert expectations about one's behavior influenced the Ss' verbal statements about their behavior. This may have affected even the more general, timeless statements found on the PEN.

Change in Overt Behavior--Relation to Other Studies and Theoretical Explanation

Another contribution of this study is that it is the first controlled experiment with which this author is familiar that found a positive effect of covert rehearsal on an important overt interpersonal response. McFall and his associates have failed to find differences of their covert rehearsal procedures on their "behavioral" measures of refusing

persistent salesmen, though they found differences on questionnaire measures. Cautela's controlled experiments using covert reinforcement for overt behavior were performed using estimates of the sizes of circles as the dependent variable. However, estimating the size of circles is not as directly relevant to therapeutic intervention as is talking to strangers. In addition, Cautela's work utilized covert reinforcement instructions, but not covert rehearsal.

Flannery (1972) found that a group of Ss who received covert reinforcement for covert approach responses to feared rats actually approached the rats more than placebo control Ss, but approached them less than Ss who received covert reinforcement for overt approach responses. Gardner (1971) had found temporary effects of a treatment similar to Homme's (1965) coverant control method on smoking. However, four months later the groups were no longer different.

There are a number of controlled experiments which have been concerned with the effects of covert punishment. (These were previously discussed in Chapter III.) Studies finding greater effects of covert punishment than placebo treatments of smoking include those by Berecz (1972), Sachs and Bean (1970), and Gardener (1970). Wagner and Bragg (1970) found that a combination desensitization and covert punishment procedure was more effective than other smoking treatments, but that either alone was not. Lawson and May (1970) found no differences between covert punishment and other methods in modifying smoking. However, their sample was very small. In addition Janda and Rimm (1972) found that covert sensitization caused greater effects on weight reduction than a placebo treatment. Most of these studies employed

Cautela's (1967) "covert sensitization" technique. Even though covert reinforcement and not covert punishment was the focus of this paper, it has been pointed out that in order to demonstrate a general isomorphism between covert conditioning principles, and overt conditioning principles both must be discussed.

In general then controlled studies using covert reinforcement and covert punishment for covert responses and studies using covert behavior rehearsal have frequently found at least temporary effects of these procedures upon overt responses which were presumed to be similar in structure to the covert responses. However, several of these studies failed to find positive effects. Studies using Homme's method (classified here as covert self-discrimination) have been particularly unencouraging (see Chapter III). The present study did not lend support to the covert reinforcement hypothesis, but did lend support to the covert rehearsal hypothesis.

The theory that was presented explained the effects of covert reinforcement and covert rehearsal procedures in terms of conditioning principles and response systems. It was also hypothesized that these response systems were originally learned according to these same conditioning principles. In general these ideas follow those of Staats (1963, 1968, 1971) and are somewhat in the tradition of ideas expressed by Skinner (1953, 1957).

It was hypothesized that the following events occur during the covert rehearsal and covert reinforcement procedures. The S, following instructions, imagines that he is in a specific situation, such as meeting a stranger. He imagines himself making a friendly response, and

then he imagines himself receiving some sort of reinforcement. The covert reinforcement increases the probability of the covert response occurring whenever he imagines meeting a stranger. This is in line with Mahoney, Thoresen, and Danaher's (1972) finding an increase in a covert response due to reinforcement. From that point there is both stimulus and response generalization so that the person will increase his overt friendly responses when he is in the situation of actually meeting a stranger. This generalization process may be accounted for either by some sort of a direct generalization process or by mediation of previously learned response systems.

One such hypothetical system that was discussed was the expectation system or the system which presumably assesses behavioral contingencies then serves as a discriminative stimulus changing the probability of other responses. The expectation response changes the probability of responses as a function of the likelihood that the response will lead to the desired reinforcement. It was further assumed that this system would be affected by changes in the probability of covert Sd-covert R-covert Sr relations such as imagining oneself talking to a stranger in a cafeteria (i.e. if the covert R is more likely given the covert Sd, it increases the expectation effect.) If these hypotheses are valid, then it becomes obvious that an expectations response system could mediate the generalization from covert conditioning to changes in overt behavior.

Therefore, the theory predicted an increase in Ss' reported expectations of the likelihood that they would be friendly in various interpersonal situations. It also predicted an increase in talking when Ss were with someone they did not know. It was expected that there would

be increments in both reported expectations and actual talking dependent variables due both to covert rehearsal and due to additional amounts of covert reinforcement. Both the expectations and talking predictions were supported by the covert rehearsal but not by the covert reinforcement results. The application of conditioning principles to covert behavior seems as though it may have a great deal to offer--including a rapprochement between traditional conditioning and cognitive theories of complex human behavior. However, as promising as it may be, it needs a great deal of research before it can be clearly supported or rejected.

Future Research on Covert Reinforcement and Covert Rehearsal

The results of this experiment look encouraging for the study of covert behavior. While this is just an early step in the investigation of covert rehearsal and covert reinforcement, it is hoped that research in this very complex, yet potentially exciting area will flourish. There are several questions for future research which arise directly as a result of this experiment.

First, some future experiments should also attempt to provide experimental designs which control for general "expectations" effects discussed above. This remains a problem in almost all research. A series of experiments using a variety of experimental designs to study covert rehearsal and covert reinforcement would provide more convincing evidence on their efficacy than a single experiment. If different methods were used to control for the expectations effects, then it would be less likely that expectations effects could account for observed differences in all experiments. The same argument holds for any other possible confounding variable such as any possible decrement effect of the P group

treatment. A number of different "placebo" treatments could be used. An additional value of doing a series of different experiments on covert rehearsal and reinforcement is that one would feel more free to generalize conclusions to more situations and different kinds of responses.

In addition to the need to clearly separate expectations effects, etc., there will be many issues to be resolved in case covert rehearsal and covert reinforcement should prove to be important variables over a whole series of experiments. For example, possibly the effects of skill acquisition, intrinsic reinforcement from the response, and covert reinforcement from the outcomes can be more effectively separated. Also parametric studies could be made to see if variables which have traditionally affected instrumental conditioning of overt responses (e.g., deprivation, reinforcement schedules, etc.) effect covert conditioning in similar ways. It is only through this type of parametric study that psychologists can come to conclusions about whether the term "covert instrumental conditioning" can be justified. For it is only through demonstrating an isomorphism between overt and covert conditioning that psychologists can conclude that the same learning principles apply to both phenomena. This experiment was an early step in the attempt to answer this question.

Covert Rehearsal as an Automated Self-Control Treatment Principle

The purpose of the experiment was not to perfect a powerful treatment procedure. Instead, the purpose was to discover and test a potentially important treatment principle in a situation which would be similar to situations where it might be applied. In the applied science

model it is desirable that experimental support for treatment principles precede further development of these principles into sophisticated techniques. Thus experimental control of variables was stressed at the possible cost of weakening the treatment procedure. For example, tape recordings were used instead of live presentations. Also, the same general scenes were used once on a large number of Ss instead of individualizing scenes for a longer treatment period for a smaller group of Ss.

It is very interesting that this relatively controlled and highly automated covert rehearsal procedure appeared to produce changes in reported specific expectations and overt behavior. Bandura's work showing the effectiveness of models on TV seems to be one effective mass communication means of changing behavior. The taped covert rehearsal scenes provide a different method. Subjects were asked to imagine themselves in certain standardized situations doing certain things on a prerecorded tape that is a potential source of mass communication. It seems entirely possible to imagine using a series of such tapes to teach Ss new complex skills including interpersonal skills such as the one used here. In the past the only psychological treatments available have usually been very expensive and have required a great deal of direct supervision by a highly trained professional.

There are potentially many practical advantages to covert rehearsal and reinforcement as treatment techniques if they can be made effective. First this technique is highly portable. Covert rehearsal and covert reinforcement can be self-administered. This means that Ss could listen to tapes where and when they want. For example, listening to a tape

immediately before going into a problem situation might be more effective than having been in a therapist's office six days before. Or one could imagine scenes without the presence of a tape recorder. This means he could use the scenes even in the immediate problem situation. It may be like bringing your own therapist to dinner.

In addition to the portability advantage, there is also a flexibility advantage. There may be great advantages to having Ss overtly rehearse responses and receive overt reinforcement in natural environmental or simulated situations. This investigator believes that overt rehearsal is the preferred technique where practical. However, it may not be practical or possible to manipulate the S's world to that extent. In that case other methods should be available. Covert rehearsal and reinforcement may be one alternative.

APPENDIX A

SITUATION-RESPONSE SCENES USED IN COVERT REINFORCEMENT AND COVERT NEUTRAL SCENES GROUPS[1]

During Class Scene

Imagine that you are sitting in one of your classes where you know very few students who sit around you. Look around the room and picture it as clearly as you can. Can you see the doors, the blackboard, the windows, the other desks? You have arrived very early this day. Other students are coming into the room. You can hear the screeching of chairs and banging of books. A fellow (girl) you have seen many times, but never talked to, comes over and sits two seats down from you. He (She) puts his (her) books down and begins straightening things out a little. Then he (she) looks toward the door and starts to watch other students coming in.

You decide that since you want to get to know other students better, you will speak to him (her). You might for instance decide to simply introduce yourself by saying something like, "Say, I've seen you here all semester, but I don't know you. My name is John Doe." Imagine yourself doing that now.

Party Scene

Imagine that you have been invited to a party by a friend. The party is at someone's house whom you don't know. You may feel a little

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[1]Each scene also included an ending or outcome. The outcomes were different for the CRR and CRN groups and are listed in Appendix B. These were the "male" scenes. The "female" scenes were identical except Ss in general talked to other females.

uneasy about going at all, but you have said you will go, so you go. You arrive and it is night.

You look at the old frame house with a small front porch that creaks when you walk on it. You knock on the old wooden screen door, and someone yells through the door to come on in. You walk into a narrow hallway and a guy comes up to you and says, "I'm Bill Haller, come on in." Imagine yourself replying by introducing yourself. Then someone calls him and he excuses himself and says, "Just make yourself at home."

You look around the room. You see several groups of people talking, but don't see anyone you know. You feel rather uncomfortable, and you wonder where your friend is. But you decide to make the best of the situation and try to meet some people and have some fun. You notice that everyone seems to be in groups talking. You can hear the dull roar of people and the stereo playing in the background. You also see some drinks on the dining table and go over and begin fixing yourself something. At the same time you sort of look over the groups to see which one looks most interesting to you.

After you have fixed your drink you walk over toward a group of people. At first you just walk up and stand there with them. You listen carefully to what they are saying so that you will be able to join in later. (There are three guys and two girls in the group.) They are talking about what kind of changes need to be made to make educational systems--especially college--better. One fellow who is tall with long dark hair thinks that there is no need for any lectures, instead everybody should have something like on-the-job training. A cute,

short, blond girl thinks that the system is just fine the way it is now. As you listen you begin formulating your own opinions and think of what you think should be done. Then when a brief pause occurs, you tell them what you think and how you feel. Imagine yourself briefly stating your position to them now.

After Lecture Scene

Imagine yourself seated in one of your classes. Think of a particular class that you presently have with an instructor you are a little afraid of. Look around the room. Imagine the doors or the windows,... the walls...the chairs...the blackboards.

Imagine seeing the other students in class. Do you recognize one or two? Now imagine that you are listening to your instructor lecturing. You seem to be following what he has said pretty well, but then he says something that suddenly makes you feel lost and confused. You didn't expect that at all. You think to yourself, "This could really screw me up on the test."

You think that maybe you had better ask the instructor what he meant. Yet this immediately makes you feel a little uncomfortable. You feel afraid that he might think you aren't too bright or that you should have understood without asking. Besides, you feel like you don't want to bother him, since he always seems so busy and in such a rush.

Suddenly the instructor stops lecturing and students start to pour out of the classroom. The instructor begins to gather his things together. You know that it is now or never. You say to yourself something like "To heck with my fear--I want to know what he meant."

You get up and walk toward him. He is just beginning to walk toward the door. Imagine yourself calling out his name. He turns toward you. Now imagine yourself telling him how confused you were about what he said. You also tell him that you hesitated to approach him because you were afraid that he might think you are stupid for asking.

Library Scene

Imagine that you are in the college library. You are at a desk reading near some book stacks. You can picture the rows and rows of stacks near you with the little call number signs on the ends. You happen to notice a student walking around who is a fellow (girl) about your own age.

He (She) looks Chinese. He (She) is wandering around and suddenly stops in front of you looking very puzzled. You decide to try to help him (her). Imagine your exact words as you ask if you can help him (her).

He (She) replies that he (she) wants some books about Mohammadism for a paper he (she) needs to write for his (her) religion class, but that he (she) doesn't even know how to find books in the library. He (She) says the librarians all looked so busy that he (she) thought he (she) would just go look around himself (herself). But he (she) can see now that is not getting him (her) anyplace.

You think it over and decide to help him (her) by showing him (her) how to look up books in the card catalog by subject, get the call numbers, then find the books in the shelves.

Imagine yourself telling him (her) that you would be happy to show him (her) how to find books for his (her) subject.

Cafeteria Scene

Imagine that you have some time and are near the student cafeteria, so you decide to go in and get something to eat for lunch. It is late and there aren't many people inside. Imagine your going into the lunch line. You get something to eat and something to drink. Notice the shiny bars that you put your tray on, the drink machines, the ice, and all the desserts and salads. You pay the cashier who takes your money, rings up the sale, and gives you change.

Then you look around to find a table where no one is sitting. You find one and seat yourself. You make yourself comfortable and begin to eat. Imagine that a fellow (girl) about your own age walks by and puts his (her) things down across the table almost next to you. He (She) pulls the chair out and sits down. He (She) straightens his (her) books out. Then he (she) begins to eat a hamburger and sip his (her) coke. You begin to think that it would be a good idea if you spoke to him (her) to be friendly. You decide that you will not let any excuse prevent you from being friendly. You decide that this time if no other you will be friendly and speak up.

You begin to think very quickly about what you will say to him (her). It might be about something in the immediate situation, about something on campus or off campus, it might be something about yourself, or it might be a personal question such as "How long have you gone to school here?", "What is your major?", or "Have you lived here long?" He (She) gives you a rather short reply. But you decide to

persist. So again you speak to him (her) in a friendly way.

Get Together Scene

You decide that you will have a few friends and acquaintances over for a get-to-gether soon.

You know that all you need is a place, a time, some food and drinks, and some people. Think of a place--it could be your place or someone else's. Think of a date and time when it will be. It might be tonight if its just a come-on-over thing or it might be something you plan ahead for. Think of what people can eat or drink. You may decide to furnish some 7-up, coke, and other mixers, but let them bring their own drinks.

So you've got everything you need but some people. This may be a little scarry if you are not used to getting a group of friends together. But you realize that this is really not much different from inviting just one or two people over. Let's pretend that you have between 3 and 15 people you'd like to call. It depends on what you want. You think of who you would call and possibly make a list of the phone numbers.

Finally, you are ready to phone some people. Imagine yourself going over to the phone. You lift the receiver off the hook. You can feel your heart pounding faster. You look at the list and think about what you'll say a minute. Then you dial the first number, but the phone rings and rings.

Depressed Friend Scene

Think of a specific friend who might get lonely or depressed. Picture his (her) dress, his (her) mannerisms and his (her) face. Imagine that you are visiting him (her) alone in his (her) home. Picture him

(her) as best you can sitting in a slumped position in his (her) chair looking very downcast.

You wonder what's wrong. Imagine yourself asking him (her). He (She) replies, "Oh, I don't know." You say "Well, don't tell me if you don't want, but maybe it will make you feel better if you do."

He (She) begins telling you about how lonely and depressed he (she) has been lately. He (She) says he (she) feels like he (she) has hardly any real close friends at all.

You listen carefully and encourage him (her) to go on. He (She) does and tells you that one of the worst things is that he (she) feels so freaky for feeling this way. He (She) feels like he (she) must be the only person to ever feel this way. Other people seem to feel so self-assured all of the time. You realize that most people feel depressed at some time or another and think that it might help if you would tell of a time when you felt very depressed and lonely, so he (she) would realize that he (she) wasn't alone. Think of a time when you felt that way that worked out OK. Imagine that you tell him about it now.

Outside Prof's Office Scene

Imagine that you are waiting outside your advisor's new office to see him. His door is shut and he is talking to another student inside. From the way they are talking you are afraid it will be awhile, so you sit down. You look around the outer office. You notice a table stacked full of boxes and papers in one corner. There is a gray metal bookshelf full of books and a two-file cabinet next to the table. His office is at one end, and the outer door at the other end of the room. Just then

another student walks in. He (She) walks over to your advisor's door, listens for a moment, then comes over and sits in the empty chair beside you. He (She) looks across the room.

You decide you will speak to the student in order to be friendly. Imagine your exact words as you tell him (her) that it looks like your advisor will be busy for awhile. The other student says quietly that, "I guess he will be." You tell him (her) that you hate to wait so long, but that you need to get your schedule straight for next semester. He (She) says that he (she) is waiting to make up a test he (she) missed. He (She) says he (she) is worried about it because he (she) missed so much class this semester. Imagine yourself asking why he (she) missed so much.

APPENDIX B

OUTCOMES FOR REINFORCING (CRR) AND NEUTRAL (CRN) SCENES GROUPS[2]

During Class Scene Outcome for CRR Group

He smiles broadly and replies in a friendly manner, "Oh, hi! I'm Jim Banner." Then you say something like, "Hey what do you think of this class anyway." Imagine his reply, and yours as you go on to discuss the class more and you already feel a liking for Jim.

Just then the professor starts to lecture, so you each start to pull out your pens and papers. But as you do you are each alert, smiling, and feeling happy. What a difference between the beginning of this class period and most of them. You talk with Jim during the next two class periods. About a week later when class is over imagine putting your things together. You feel like you want to get to know Jim better. So you decide to ask him if he'd like to get a coke, a beer, or lunch with you later on. Imagine your doing that. He smiles and says, "Ha, you know that's funny. I have thought about asking you the same thing, but I didn't say anything." You both laugh. Then you set a time and leave. Inside, you feel very good and warm because with just a little effort, you've gone a long way toward making a new friend.

During Class Scene Outcome for CRN Group

He looks over and replies, "Oh,...ah, I'm Jim Banner." Then you say something like, "Hey what do you think of this class anyway." Imagine his reply, and yours.

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[2]These are outcomes for the situation-response scenes listed in Appendix A. Also, these are the "male" scenes. "Female" scenes were identical except the other persons in the scene in general were females.

Just then, the professor starts to lecture, so you each start to pull out your pens and papers. You feel rather sleepy and out-of-it as the lecture starts, which is the way you usually feel.

You see Jim during the next two class periods. You think that though you haven't gotten to know him too well yet you will try to get to know him better. So you decide to ask him if he'd like to get a coke, a beer, or some lunch with you later on. Imagine you're doing that. He looks at you and says, "Thanks, but I'm meeting some friends for lunch already." You say, "Oh, fine. Maybe we can make it another time." You leave the class alone, and notice other students leaving also. You see Jim about a week after that in class as he enters the classroom. You see that he is looking the other way and goes over to sit in a place across the room. You think well maybe you can still get to know him later.

Party Scene Outcome for CRR Group

Each of the other four group members looks at you casually and seems interested in what you are saying. They are quiet and seem to want you to go on. A tall guy is nodding his head in agreement with what you are saying. One girl with long dark hair is frowning a little as if she may disagree slightly. They begin to ask you questions, and seem pleased by your answers. Then the dark-haired girl who had been frowning seems to be changing her position to match yours.

After you have all been discussing this awhile, you notice people seem to be running out of words. Imagine yourself saying something like "Now that we've settled that problem, I think I'd like something to

munch on." Everyone smiles and begins to follow you to the snack tray to get something to eat. Then they begin asking you questions about yourself. You suddenly realize how accepted you feel.

The realization that you overcame your initial anxiety and successfully broke into a group of total strangers makes you feel even better. You feel a sense of strength surge through you--like you could walk into any group and join in.

Party Scene Outcome for CRN Group

A tall guy and a girl with long dark hair turn toward you as you are talking. The other two continue to talk to each other. The tall guy continues to sip his drink while you are talking, but appears to be listening to what you are saying. The girl walks away and gets some chip and dip and returns. After you are finished with what you were saying, the tall guy and girl with long dark hair turn back and start listening to the other two who were talking all along. You just decide to listen too. After awhile the two that were talking seem to run out of things to talk about. Imagine yourself saying, "Now that that problem is settled, I think I'd like something to munch on." You go over to the snack table. One of the fellows in the group walks over to another group, one of the two girls start talking to each other, and the other guy goes over to another table and fixes himself another drink.

You decide to leave fairly early. You look around for your friend, and find that he still has not arrived. Then you decide to see if you can find the host to say goodbye. You have forgotten his name, but think that it doesn't matter much. Finally, you locate him and tell

him you need to get home. You wave and walk back through the narrow hall and onto the squeaky porch.

After Lecture Scene Outcome for CRR Group

He laughs and says, "You know its funny. When I was a student I felt the same way you do about approaching my teachers. I never realized until I was an instructor myself that teachers don't feel that way at all. I know darn well that all my students have questions, I genuinely admire those--like you--who have the get-up-and-go to come up and hash things out. As it works out, it usually turns out to be the better students who ask questions. I wish I could get more to do it."

You notice that your tenseness has eased quite a bit, your heart is beating at a normal pace again, and you feel very pleased with yourself. You feel a genuine warmth toward him for his understanding, and you are really glad that you approached him. It seems so really simple to just ask when you have a question instead of stewing over it.

Then something else happens. The next day in class as the period is drawing to an end the Prof. says to the class, "If any of you have questions come and talk to me. One student yesterday asked me a question and had the courage to tell me just how he felt. He is the kind of student who will help get good communication going. He is going to do well in this course if he continues to seek real depth understanding like that." You feel warm inside and your whole body pulsates with pride in what you did. What a pleasant, unexpected surprise to be used as a positive example for the whole class.

After Lecture Scene Outcome for CRN Group

He looks back at you and tells you that asking questions doesn't mean you are stupid. It may just be that you didn't understand the lecture, which could have even been his fault. Though, he adds that he did his best to make it clear.

Then he tells you that he will not be able to answer your question now, but asks you to either try again next class period or come and see him during his office hours. You ask him when they are, and he tells you that they are listed on the class syllabus which he handed out the first day of class. You thank him, and he hurries on out the door.

The next day in class the lecture goes on as usual. At the end of class, though, he tells students that if they want to see him, they may do so during his office hours. He then repeats when they are. He also suggests that students may phone him.

Library Scene Outcome for CRR Group

He smiles and says that he very much appreciates your kindness and would appreciate it if you could help. But he doesn't want you to if it will be an inconvenience at all.

You assure him that it won't be and suggest that the two of you go downstairs to the card catelog. Imagine yourself taking him downstairs. You show him how to use the card catelogs and are heading toward the section upstairs where the books on Mohammadism are. He turns and says, "That's so easy, and to think I was just looking through all of those books before." You smile and laugh a little about that. You decide to introduce yourself. Imagine yourself doing

that, and imagine his replying that his name is Ben Suharu. He adds that he is from Indonesia, and has just been over in the United States this semester.

Meanwhile, you show him the call numbers at the end of the aisles. He smiles and thanks you in a way that makes you feel like he is very appreciative of what you did. He adds, "You are the first American student I have met since I have been here. I am very happy to meet American students." Imagine that you tell him that you are happy to meet an Indonesian student and you ask him questions about what he thinks of the U.S. and questions about Indonesia. The more he talks the more fascinated you become with hearing about things you knew nothing about before. During the conversation, he tells you that he is living with his Uncle and Aunt here and he would like you to come over for dinner some night for a real Indonesian dinner. You feel very pleased that he has asked, and agree to come.

Library Scene Outcome for CRN Group

He says that he is glad someone will help him. Then he asks if you can help him right now, that he is in a hurry.

You say that you can, and suggest that the two of you go downstairs to the card catalog. Imagine yourself taking him downstairs.

You arrive at the card catalog downstairs. You can see drawer after drawer. Imagine yourself telling him to find the subject Mohammadism first. He does so and you show him that the call numbers are on the left top corner of the cards. He selects a few titles and discovers the books all seem to have about the same call numbers. You see that they should be on the second floor, so you take him back up him-

self for having taken the initiative to speak first. You say to yourself that this is the ability that others who make friends easily have developed. Now I am developing it myself.

Cafeteria Scene Outcome for CRN Group

Imagine that he again gives you a rather businesslike reply as he begins gathering his things together. He stacks his books and tucks them under his arm as he is getting up. He then picks up what is left of his coke and takes it with him. You begin to look around the cafeteria again and notice other people walking around. You start to look at them and notice things about them. Then you look over at some paintings that have been hung on the wall. They seem to all be paintings of household items and boats. You finish your lunch, pick up your books, and leave. You begin thinking about the class that will be coming up soon. You wonder if the instructor will announce when the next test will be. You think that he has waited quite late to annouce it; but you aren't worried, since you feel that you are fairly well prepared.

Get Together Scene Outcome for CRR Group

You call the next person and ask him if he can come. He replies that he would really like to come. He asks you what the occassion is. You reply that you're just doing it so some of your friends can get acquainted with each other and you can all have a good time.

He says that he thinks that is really a great idea. He says he thinks its really neat that you would just call people up like that. He says he has thought about it before, but he never got around to it. You reply that you have put it off too, but that you finally got your-

self together and did it. He asks what he can bring? You tell him to bring any booze he wants, but you are furnishing mixers. He asks if there isn't something else he can bring. You say no, even though he seems anxious to help. You talk a little longer then he thanks you again for asking him, and you say goodbye. You phone everyone on the list. You have a little difficulty reaching several of the people on it, but finally get them all. In general you were surprised at how responsive people were. They seemed really flattered that you had cared enough to ask them to come. About one-fourth of the people couldn't come, but even they seemed genuinely pleased that you had asked them and seemed to have good reasons why they couldn't come. The whole things makes you feel really good that so many wanted to come to your get-together.

The evening of the get-together people casually come in and you are pleased at how well people talk with each other. Even people whom you weren't sure would get along with each other seemed to have good conversations. There is a lot of talk and laughing during the party--yet no one felt compelled to talk. It is relaxed. After the get-together is over you know you had a good time, and everyone else seemed to also. People stayed late, and everyone was in a hearty spirit when they left. Several people commented upon how much fun they had. One fellow tells you he usually hates being in groups, but that this was so relaxed that he really enjoyed it. Several people ask if they could help clean-up. You feel really happy and excited inside. Your stomach seems to leap around. To think that you had helped to cause these people to have such a good time together. You

have turned what had seemed like a far-out idea a few days ago into a real fine happening. You feel a little like pinching yourself to make sure its real!

Get Together Scene Outcome for CRN Group

You call the next person and ask him if he can come. He replies that he would like to come, but that he has a paper that will be due about a week after that, and he doesn't think that he had better come. You tell him that you are sorry he can't come. You say goodbye and hang up.

You call the next person on the list. You tell him about your get-together and ask him if he would like to come. He says that he thinks he can, but he isn't sure. He says that it depends upon whether or not some other plans come through. You talk for a little bit more, then he says he has to go, and you say goodbye and hang up.

Then you call the next person on the list. She was home, but was not sure if she could come to the party or not. She would have to check, because she said she thinks she already has something planned for that evening. You tell her to please let you know when she finds out.

Although you have a little difficulty reaching several of the people on the list, you finally get them all. In general you didn't do too badly. About half of the people said they thought they could come.

The evening of the get-together you had fewer people show up than expected, but there are still enough people. People seemed to get along with each other all right, with just a couple of exceptions. One

fellow didn't talk to hardly anyone much and then left very early. There was also a little awkwardness because some of the people didn't seem interested in the same things. There were a couple of people who didn't bring anything to drink and sort of bummed quite a bit off of others. but you really didn't mind that too much. The group seemed to get tired early and people began leaving. Some said they had to get up early in the morning. As people were leaving one fellow told you he had a good time. In a way you were glad people left early, so you could clean up the mess a little now instead of tomorrow. So you begin to do that.

Depressed Friend Scene Outcome for CRR Group

As you are talking you notice that he seems to be listening intently to what you say. Also, you notice that his posture and facial expression perks up some. He talks faster and in a higher pitch as he asks you questions about your experience. And he spontaneously comments two or three times, that is just the way I feel.

When you are finished, he says, "Gee, I just can't believe how much better I feel." "I don't know why, but I feel relieved. I guess part of it is knowing that I'm not so wierd--I don't know. But part is just that you were interested enough to talk with me about it and tell such a personal thing about yourself. I guess right now at least I feel like I've got at least one friend, and that helps a lot. I really appreciate your concern--you don't know what a big help you've been!"

Depressed Friend Scene Outcome for CRN Group

As you have been talking you notice that he has not looked up at all, hardly even moved or spoken. He just continues to look at the

floor. He hardly responds at all, and you are not sure whether he was listening or not. Finally, you ask him if he heard you. He replies slowly in a rather faint voice that he did. You look at him some more. He adds that he is sorry he is such a drag right now, but that he will probably be feeling better tomorrow. You talk a little while longer, then decide you had better go. So you leave, and hope he will feel better soon.

Outside Prof's Office Scene Outcome for CRR Group

He replies that it was because he was helping to make a TV movie for CBS television this semester on Kauai. You suddenly feel yourself becoming very alert and interested. You ask him about it. He tells you that it is a film that will be starring Steve McQueen in his first TV movie. It is the story of a scuba diver who lives on Kauai. You are really fascinated and want to know all about what he does. You want to know all about him, Steve McQueen, what its like to film, what unusual experiences he's had and so forth. He seems very happy that you are interested. He becomes very animated and dramatic. He tells you that he is a technician and diver himself, and joyfully answers your questions and throws in some fascinating stories about some of his adventures. Then he tells you that he'd like to show you his camera outfit and take you to some filming nearby if you are interested. He tells you he can get you a special pass, and that only a few people are allowed to watch the actual filming. He takes your name and phone number, and tells you that he will call you when he knows the exact time. You feel a tinge of excitement spurt through you, because that sounds like such a different and fun thing to do. You think to yourself

that it is funny. You were just sitting next to this guy who seemed like every other student. Yet come to find out even the most average-looking person can have fascinating things to tell if you only bother to find out what they are.

Outside Prof's Office Scene Outcome for CRN Group

He replies that it was because he just didn't like the course too much. He says that he thought it was kind of boring, and that besides he really didn't know if he wanted to finish school anyway. You ask him why, and he says he just doesn't know what he wants to do, but that he doesn't think a college education is much good for making money anyway. He starts moving around some, then says "I'll be right back, don't let anyone get my place, OK?" He puts his books in the chair and walks out the door. You seem a bit surprised by it all. You continue to look around the room. You notice that there is a large piece of metal sculpture in the corner under the desk. You begin to look at it and see that it is made out of old bottle caps welded together. It is put together in the form of a large sailing ship. It has three masts. You wonder what it is doing there under the table?

APPENDIX C

PLACEBO TREATMENT LECTURE AND QUESTIONS

Freud has said that the human Psyche is divided into three parts--the id, ego, and superego. He thought that the nature of these three parts determined a person's behavior. He said that the id is the part from which all basic psychic energy comes from. It is the storehouse of energy. It includes all of the basic drives. The fundamental principle which he thought the id operated under was the pleasure principle. That is the id seeks what is most pleasant regardless of who gets hurt in the long run. A small baby can be said to live primarily by the pleasure principle.

After awhile though the child starts to get punished by his parents for hurting others and doing things they don't like. This causes the child to internalize his parents' wishes and rules. The result of this is the development of the child's superego (commonly called his conscience). Freud thought that men should have consciences. But he thought that many neuroses stem from having too strong of a conscience. For example a person that gets depressed too much may do so because his strong conscience causes him to frequently get angry with himself. Yet too weak of a superego may cause a person to mistreat others, to lie and cheat, and to be a drain on society. He thought that criminals for example usually have too weak of a superego.

Freud conceived that the ego was sort of caught in the middle between the id and superego. The ego could be the center for rational thinking and planning, and had the power to divert potentially harmful drives from the id such as aggression to self or socially useful func-

tions. For example a man with a lot of aggression could divert it to work hard on his job.

The term ego strength has come to be a very positive one in psychology and applies to the person who thinks rationally and acts realistically. Yet the ego can also be the center for ego defense mechanisms to protect itself from being overcome with anxiety. Rationalization is one example. Blaming others when you are at fault is another neurotic defense mechanism. Thus again analyzing ones ego takes some thought.

The id so far has been portrayed as almost all bad. Yet that is not the entire story. For if a person is too controlled by his ego and superego, he will be too controlled. Freud thought of the id as being the source of creative and artistic impulses. So some expression of them is good. However, if the id or pleasure principle gains real control over the personality, it is possible that the person may become either a criminal type or psychotic. So in a sense domination by the id is the worst possible event.

Many of these basic ideas have survived the test of time. For instance today Humanistic Psychologists such as Carl Rogers and Abraham Maslow have espoused many ideas which are similar to Freud's. Rogers especially has used similar concepts. Freud's ego is like Roger's Self. Freud's superego is like Roger's ideal self and Freud's id is like Roger's organismic evaluator. These concepts are all important.

The questions below will serve as a guide to help you explore your own feelings, thought, and relationships with your parents in order to help you understand your id, ego, and superego better. It is hoped that

knowing these concepts and answering these questions can help you understand yourself a little better.

1. Think about your mother (or if you never knew her well about the woman who was most like a mother).
   a. Imagine what she looks like. Try to describe her physical appearance.
   b. What is her personality like? Think about that for awhile.
   c. How has she treated other members of the family—especially your father and you? Think about that for awhile.
   d. How did you feel toward your mother as a child? Think of both the positive and negative feelings.
   e. How do you feel toward your mother now? Reflect upon that.
   F. How should you feel toward your mother? Is this much different than you do feel?
   g. What can you do to improve your relationship with her?
2. (Repeat same questions using Father, a-g.)
3. Let's focus upon your Id.
   a. How often do you give in to your impulses? Think about some times that you have done this.
   b. Think of some times when you <u>should</u> have given in to your impulses when you <u>didn't</u>.
   c. Think of some times when you <u>did</u> give in to your impulses when you <u>shouldn't</u> <u>have</u>.
   d. How creative are you? Think of how you could be more creative.
   e. How impulsive are you? Think of how you can learn to control undesireable impulses more.

4. Let's focus upon your Superego now.

   a. How often do you feel depressed and guilty when you really shouldn't? Think of some times when you have.

   b. What can you do to make yourself feel less guilty and depressed? How can you relieve your overstrong conscience then?

   c. How often do you hurt other people more than you should? Think of some times.

   d. What can you do to prevent doing these kinds of things in the future?

5. Now let's focus upon your Ego or Inner Self.

   a. How often do you make realistic plans and carry them out? Think of some times when you have.

   b. Think of some times when you haven't planned adequately or carried out your plans.

   c. What can you do to improve your planning and carrying out plans in the future?

   d. Think of the excuses and other irrational means of avoiding unpleasant situations and anxiety that you most often use. These are called defense mechanisms and prevent you from acting rationally. Identifying them can help reduce them.

   e. One way of looking at defenses is times that you are not honest with yourself. Think of some ways that you are not honest with yourself.

   f. Think of some times that you were honest with yourself and how you can be more honest with yourself in the future.

APPENDIX D

QUESTIONNAIRE PACKAGE GIVEN TO ALL MALE SUBJECTS

Background Information

Name _____

Telephone number _____

Address _____

Age _____

Sex _____ EXACT TIME BEGIN_____

Ethnic Group _____ EXACT TIME FINISH_____

Number of years of college _____

Approximate grade point average ___

Marital Status _____

Student I.D. Number _____

Answers to "Questionnaire"

(Circle your choice)

1. T F	11. T F	21. T F
2. T F	12. T F	22. T F
3. T F	13. T F	23. T F
4. T F	14. T F	24. T F
5. T F	15. T F	25. T F
6. T F	16. T F	26. T F
7. T F	17. T F	27. T F
8. T F	18. T F	28. T F
9. T F	19. T F	29. T F
10. T F	20. T F	30. T F

--- PLEASE PUT YOUR NAME ON EACH ANSWER SHEET FOR EACH QUESTIONNAIRE THAT YOU ARE GIVEN IN THIS EXPERIMENT

QUESTIONNAIRE

Here is a series of statements which a person might use to describe himself. Read each statement and decide whether or not it describes you. Then indicate your answer on the separate answer sheet.

If you agree with a statement or decide that it does describe you, answer TRUE. If you disagree with a statement or feel that it is not descriptive of you, answer FALSE.

In marking your answers on the answer sheet, be sure that the number of the statement you have just read is the same as the number on the answer sheet.

Answer every statement either true or false, even if you are not completely sure of your answer.

1. I feel relaxed even in unfamiliar social situations.
2. It is easy for me to relax when I am with strangers.
3. No matter who I'm talking to, I'm always a good listener.
4. I have no particular desire to avoid people.
5. I often find social occasions upsetting.
6. There have been occasions when I took advantage of someone.
7. I usually feel calm and comfortable at social occasions.
8. I am usually at ease when talking to someone of the opposite sex.
9. I am sometimes irritated by people who ask favors of me.
10. I try to avoid talking to people unless I know them well.
11. I have never deliberately said something that would hurt someone's feelings.
12. If the chance comes to meet new people, I often take it.

13. I often feel nervous or tense in casual get-together in which both sexes are present.
14. It is sometimes hard for me to go on with my work if I am discouraged.
15. I am usually nervous with people unless I know them well.
16. Being introduced to people makes me tense and nervous.
17. There have been occasions when I felt like smashing things.
18. Even though a room is full of strangers, I may enter it anyway.
19. I would avoid walking up and joining a large group of people.
20. I sometimes try to get even rather than forgive and forget.
21. I often feel on edge when I am with a group of people.
22. I tend to withdraw from people.
23. I always try to practice what I preach.
24. I don't mind talking to people at parties or social gatherings.
25. I often think up excuses in order to avoid social engagements.
26. I never hesitate to go out of my way to help someone in trouble.
27. I sometimes take the responsibility for introducing people to each other.
28. I try to avoid formal social occasions.
29. I have never intensely disliked anyone.
30. I find it easy to relax with other people.

FAE Situation Questionnaire

(Form M)[3]

This questionnaire measures only what it simply appears to—namely, how you think you will act in the various situations described below. There is no hidden or "deeper" meaning to your answers. Therefore, it is very important that you try to be an honest as possible.

Please try to:

(1) imagine that you are actually in the situation and

(2) respond as you think you probably would if this really happened to you in the near future.

1. You are in a department store shopping. You see an acquaintance whom you don't know very well. He hasn't seen you yet. You would probably

(1) go over and start a conversation with him.

(2) go in the other direction before he sees you.

(3) keep doing what you are doing.

(4) say hello only if he sees you.

(5) get his attention and say hello.

2. You hear that a good friend is in the hospital. You would probably

(1) phone him.

(2) go see him.

(3) not do anything.

(4) send him a card.

---

[3]Female packets were identical except that female forms of the FAE questionnaires were used.

3. You ask a TV repairman to look at your TV. He tells you he will charge you $10 to fix it. When it is done he hands you a bill for $20. You would probably

(1) pay the bill as is and say nothing.

(2) refuse to pay the extra $10 unless you are very confident he acted in good faith.

(3) act as in "2", but also speak in a pleasant manner.

(4) ask him about it, but probably pay the bill even if you don't believe or understand his explanation.

4. You make a new acquaintance at a party who asks you to phone him to do something together next week. You like him. You would probably

(1) do it, and look forward to doing it.

(2) tell him you would, but not do it.

(3) do it, but be a little anxious about it.

(4) tell him some reason why you can't do it.

5. You bump into someone you used to know. He says hello, then invites you to come to a party he is giving. You suspect that you won't know anyone there except him. You would probably

(1) tell him you don't want to go because you don't know anyone.

(2) tell him you will go, but inside you feel a little uncomfortable about going.

(3) tell him you will go, and inside feel you really want to go.

(4) tell him you will go, but not show up.

6. You are dining at a pizza parlour with a friend. You see another friend come in with someone you don't know. He doesn't see you but is looking for a table. You would probably

(1) wait until he gets seated, then greet him.

(2) say hello right then, before he is seated.

(3) keep doing what you are doing.

(4) ask them to join you.

(5) turn away so he won't see you.

7. You are placed in a discussion group for one hour with five strangers. No one has been designated leader. No one talks at first. You would probably

(1) keep quiet until spoken to.

(2) address the group and suggest everyone get acquainted.

(3) talk to the person nearest you.

(4) wait for one person to talk, and then join in.

8. You have a friend whom you have known a while, but never done anything socially with. You would like for him to accompany you to a movie. You would probably

(1) wait for him to initiate any such social activity.

(2) ask him to go the next time you see him.

(3) phone him right then and ask him if he wants to go.

(4) wait until you see him at school and hint of the activity, hoping he will suggest going together.

9. One year from today you will probably describe your past year's behavior as being which of the following

(1) very shy

(2) shy

(3) average

(4) outgoing

(5) very outgoing

___ Please record the time you finish.

___ Did you complete the questions on the back of "Questionnaire"?

___ Please remain seated until the experimenter returns.

Thank you!

Name _____

ATTITUDE SURVEY

Please answer the following items by making a quick decision based upon how you feel toward the item. Circle the number that best approximates your feelings.

	highly unpleasant (1)			neutral (5)				highly pleasant (9)
1. Going to a party	1	2	3	4	5	6	7	8	9
2. Talking to a stranger in a class	1	2	3	4	5	6	7	8	9
3. Helping a stranger who appears lost	1	2	3	4	5	6	7	8	9
4. Asking someone who cut in line to go to the rear of the line	1	2	3	4	5	6	7	8	9
5. Asking a friend who seems worried what the matter is	1	2	3	4	5	6	7	8	9
6. Having some people over for a get-together	1	2	3	4	5	6	7	8	9
7. Asking your instructor for help	1	2	3	4	5	6	7	8	9
8. Starting a conversation with a stranger	1	2	3	4	5	6	7	8	9
9. Washing dishes	1	2	3	4	5	6	7	8	9

P. E. N. INVENTORY

Please indicate your answer to each question on the IBM answer sheet. If the answer is 'Yes', fill in the space marked '1'. If the answer is 'NO', fill in the space marked '2'. You should use a no. 2 pencil and erase mistakes completely.

There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the question. Remember to answer each question.

1 - YES 2 - NO

1. Are you more distant and reserved than most people?
2. Can you get a party going?
3. Would you do almost anything if dared to do it?
4. Would you enjoy hunting, fishing and shooting?
5. Do you nearly always have a "ready answer" when people talk to you?
6. Are you rather lively?
7. Do you like plenty of bustle and excitement around you?
8. Do you like mixing with people?
9. Would you call yourself happy-go-lucky?
10. Can you usually let yourself go and enjoy yourself a lot at a wild party?
11. Do you like people around you?
12. Do you like going out a lot?
13. Do you like practical jokes?
14. Do you normally prefer to be alone?
15. Do you find it hard to show your feelings?

16. Would you call yourself talkative?

17. When you were a child did you often like a rough and rowdy game?

18. Do you like telling jokes or funny stories to your friends?

19. Do you make friends easily with members of your own sex?

20. When you make new friends do you usually make the first move?

FAE Situation Questionnaire

(Form M)

This questionnaire measures only what it simply appears to—namely, how you think you will act in the various situations described below. There is no hidden or "deeper" meaning to your answers. Therefore, it is very important that you try to be as honest as possible.

Please try to:

(1) imagine that you are actually in the situation and

(2) respond as you think you probably would if this really happened to you in the near future.

1. You are in a department store shopping. You see an acquaintance whom you don't know very well. He hasn't seen you yet. You would probably

(1) go over and start a conversation with him.

(2) go in the other direction before he sees you.

(3) keep doing what you are doing.

(4) say hello only if he sees you.

(5) get his attention and say hello.

2. You hear that a good friend is in the hospital. You would probably

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(2) go see him.

(3) not do anything.

(4) send him a card.

3. You ask a TV repairman to look at your TV. He tells you he will charge you $10 to fix it. Shen it is done he hands you a bill for $20. You would probably

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(2) refuse to pay the extra $10 unless you are very confident he acted in good faith.

(3) act as in "2", but also speak in a pleasant manner.

(4) ask him about it, but probably pay the bill even in you don't believe or understand his explanation.

4. You make a new acquaintance at a party who asks you to phone him to do something together next week. You like him. You would probably

(1) do it, and look forward to doing it.

(2) tell him you would, but not do it.

(3) do it, but be a little anxious about it.

(4) tell him some reason why you can't do it.

5. You have 8-10 friends--most of whom don't know each other very well. You would probably

(1) avoid getting ones who didn't know each other together.

(2) have a party in order to get them all together at once.

(3) if it is convenient, invite two who don't know each other to do something with you.

(4) make a conscious effort to get 2 or 3 who don't know each other together at a time.

6. You have noticed that a close friend has recently seemed very irritable towards others. You would probably do which of the following?

(1) tell him he seems more irritable, then encourage him to talk about it.

(2) avoid commenting about it as much as possible.

(3) if he asked, tell him he did not seem irritable.

(4) <u>if he asks</u>, tell him he does seem more irritable, then encourage him to talk about it.

7. You are in the campus bookstore looking at the books for next semester in your major. Someone else you don't know is looking at some of the same books you are. You would probably

(1) initiate a conversation with him.

(2) leave.

(3) carry on a conversation, if he speaks to you first.

(4) ignore him.

8. It is 7:00 at night and you are finishing a paper that is due in two days. Suddenly you have an important question about what to do. You cannot go on without knowing the answer. You could see the professor tomorrow, but then you might not get the paper finished in time. You could call a friend, but he is a poor student and a wrong answer could mess up your whole paper. You would probably

(1) call the friend.

(2) call the professor now.

(3) see the professor in his office tomorrow.

(4) take a chance and complete the paper.

9. You hear that a good friend of yours is leaving town in three weeks. You would probably

(1) say goodbye if you happen to run into him.

(2) contact him and also do something special for him such as having friends get together to say good-bye or buying him a present.

(3) phone him to say goodbye if you don't see him.

(4) phone him and arrange a time to get together.

10. You see someone who seems to be looking for something in the grass. You would probably

(1) ask him what he is looking for and help him look for it.

(2) walk on by or just watch him.

(3) watch him and speak to him.

11. You attend a party. You know only one person, and he has not arrived yet. You would probably

(1) find another person who is alone and join him.

(2) attempt to form a group by rounding up people who are nearby.

(3) join a group who is already talking.

(4) sit alone and wait for him to arrive.

12. You have just gone through the cafeteria lunch line and are looking for a place to eat. You see a casual friend who is with someone else you don't know. You would probably

(1) say hello and ask if they mind if you join them.

(2) sit by yourself even if he had been alone.

(3) sit by yourself, since he is not alone.

(4) say hello and wait to be asked to join them.

(5) walk by and say hello.

13. Your instructor asks you to give a special 10 minute talk on a topic you are enthusiastic about to your class. You would receive extra class credit. You have time to prepare. You would probably

(1) agree to do it, but have a strong fear of doing it.

(2) tell him you would prefer not to because it is so unpleasant for you.

(3) make up a reason for not doing it.

(4) agree to do it, but have a moderate fear of doing it.

(5) agree to do it, and actually look forward to doing it.

14. You bump into someone who you used to know. He says hello, then invites you to come to a party he is giving. You suspect that you won't know anyone there except him. You would probably

(1) tell him you don't want to go because you don't know anyone.

(2) tell him you will go, but inside you feel a little uncomfortable about going.

(3) tell him you will go, and inside feel you really want to go.

(4) tell him you will go, but not show up.

15. You are dining at a pizza parlour with a friend. You see another friend come in with someone else you don't know. He doesn't see you but is looking for a table. You would probably

(1) wait until he gets seated, then greet him.

(2) say hello right then, before he is seated.

(3) keep doing what you are doing.

(4) ask them to join you.

(5) turn away so he won't see you.

16. You are placed in a discussion group for one hour with five strangers. No one has been designated leader. No one talks at first. You would probably

(1) keep quiet until spoken to.

(2) address the group and suggest everyone get acquainted.

(3) talk to the person nearest you.

(4) wait for one person to talk, and then join in.

17. You have a friend whom you have known a while, but never done anything socially with. You would like for him to accompany you to a movie. You would probably

(1) wait for him to initiate any such social activity.

(2) ask him to go the next time you see him.

(3) phone him right then and ask him if he wants to go.

(4) wait until you see him at school and hint of the activity, hoping he will suggest going together.

18. One year from today you will probably describe your past year's behavior as being which of the following

(1) very shy

(2) shy

(3) average

(4) outgoing

(5) very outgoing

---Don't forget to record the <u>exact</u> time that you finish.

Thank you

---Please wait here for the experimenter to return.

APPENDIX E

KEYS TO QUESTIONNAIRES

Social Anxiety (SAD) Scale Items

1-F	7-F	13-T	19-T	25-T
2-T	8-F	15-T	21-T	27-F
4-F	10-T	16-T	22-T	28-T
5-T	12-F	18-F	24-F	30-F

Marlowe-Crowne Items

3-T	14-F	23-T
6-F	17-F	26-T
9-F	20-F	29-T
11-F		

Pen Extroversion Scale

1-no	5-yes	9-yes	13-yes	17-yes
2-yes	6-yes	10-yes	14-no	18-yes
3-yes	7-yes	11-yes	15-no	19-yes
4-yes	8-yes	12-yes	16-yes	20-yes

FAE Questionnaire

11. 1=5, 2=1, 3=2, 4=3, 5=4
12. 1=3, 2=4, 3=1, 4=2
13. 1=1, 2=3, 3=4, 4=2
14. 1=4, 2=1, 3=3, 4=2
15. 1=1, 2=4, 3=2, 4=3
16. 1=4, 2=2, 3=1, 4=3
17. 1=4, 2=1, 3=3, 4=2
18. 1=2, 2=4, 3=3, 4=1
19. 1=1, 2=4, 3=2, 4=3

110. 1=3, 2=1, 3=2
111. 1=2, 2=4, 3=3, 4=1
112. 1=5, 2=1, 3=2, 4=4, 5=3
113. 1=3, 2=2, 3=1, 4=4, 5=5
114. 1=2, 2=3, 3=4, 4=1
115. 1=3, 2=4, 3=2, 4=5, 5=1
116. 1=1, 2=4, 3=3, 4=2
117. 1=1, 2=3, 3=4, 4=2
118. 1=1, 2=2, 3=3, 4=4, 5=5

APPENDIX F

DEBRIEFING QUESTIONNAIRES

CRR and CRN Group Debriefing Questionnaire

Name _____

Questions About the Experiment Itself

1. What comments do you have about the experiment (you may use back if necessary)?

2. How helpful do you think this experiment was in helping you to become more friendly and assertive in the future (circle one).

not very helpful				very helpful
1	2	3	4	5

3. How pleasant was listening to the scenes on the tape (circle one)?

highly unpleasant				neutral				highly pleasant
1	2	3	4	5	6	7	8	9

4. On the average, how plesant would it have been if the events described in scenes had really happened to you (especially the last half of the scenes)?

highly unpleasant				neutral				highly pleasant
1	2	3	4	5	6	7	8	9

5. On the average, how believable did the scenes seem for you personally?

unbelievable				highly believable
1	2	3	4	5

6. How real or clear did the scenes seem to you as you were imagining them? Did you feel like you were actually in them?

Very unreal and unclear				very real and clear
1	2	3	4	5

7. To what extent did you fill in the blanks and imagine additional details and words as asked by the narrator?

not at all	a little	part of the time	most of the time	almost all of the time
1	2	3	4	5

8. Did you ever think that the experimenter was looking for something that he hadn't told you about? (yes or no)

9. He was looking for something. What do you think it might have been?

10. Did you think you were in a control group?

11. Have you ever met the other subject in the experiment before? (If "yes", then how well do you know him (her)?)

hardly at all	acquaintence	friend
1	2	3

Placebo Group Debriefing Questionnaire

Name _____

Questions About The Experiment Itself

1. What comments do you have about the experiment (you may use back if necessary)?

2. How helpful do you think this experiment was in helping you to become more friendly and assertive in the future (circle one).

   not very helpful — very helpful
   1 2 3 4 5

3. How interesting was this experiment (circle one).

   very boring — neutral — very interesting
   1 2 3 4 5 6 7 8 9

4. On the average, how pleasant was thinking about these questions? (circle one)

   highly unpleasant — neutral — highly pleasant
   1 2 3 4 5 6 7 8 9

5. On the average how thought-provoking were the questions?

   not at all — highly thought-provoking
   1 2 3 4 5

6. How much of the time did you actually think about what you were asked to?

   not at all — almost all the time
   1 2 3 4 5

7. Did you ever think that the experimenter was looking for something that he hadn't told you about? (yes or no)

8. He was looking for something. What do you think it might have been?

9. Did you think you were in a control group? Do you think so now?

10. Have you ever met the other subject in the experiment before?

(If "yes", then how well do you know him (her)?)

hardly at all	acquaintence	friend
1	2	3

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