

COGNITIVE BEHAVIOR MODIFICATION: AN EVALUATION
OF THE EFFECTS OF LANGUAGE TECHNIQUES UPON
EMOTIONAL AROUSAL

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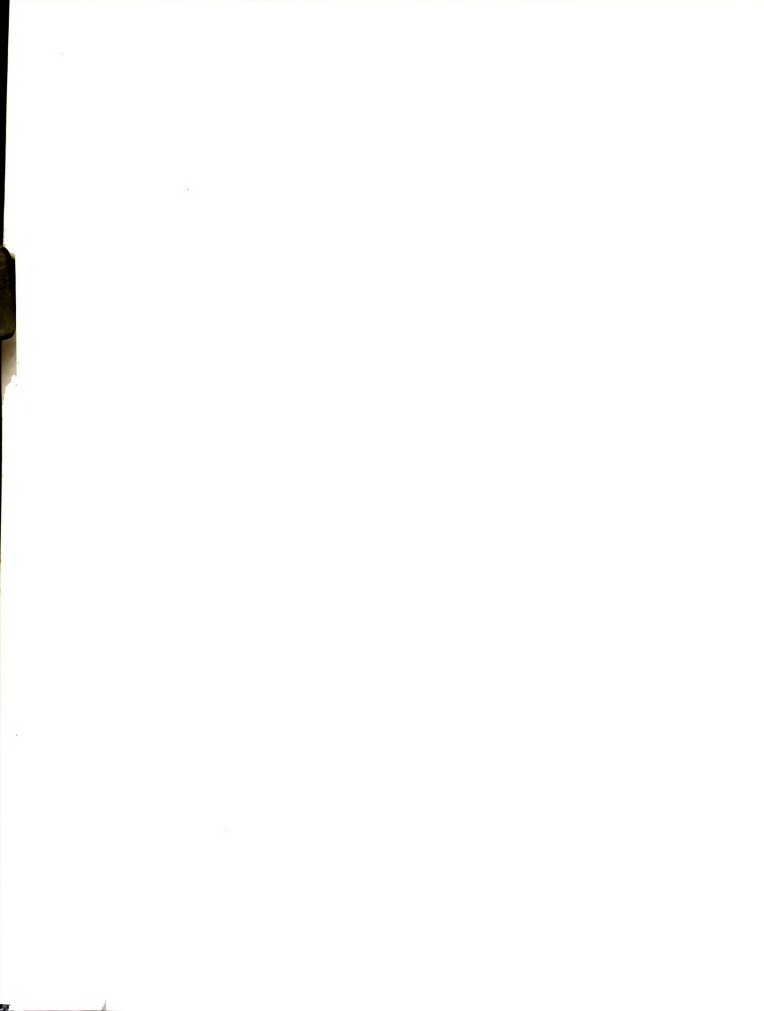
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ABSTRACT

COGNITIVE BEHAVIOR MODIFICATION: AN EVALUATION
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By

Steven E. Elson

The purpose of this study was to examine three basic questions of both theoretical and practical import for cognitive behavior modification: (a) Is the classical conditioning model of rational emotive therapy (RET) posited by Russell and Brandsma (1974) an adequate one? If so, (b) are three analog treatments of language-conditioning techniques based on that model effective in reducing anxiety (emotional arousal)? And (c) can anxiety be learned through strictly verbal conditioning procedures, as implied in the Russell and Brandsma model?

To answer these questions, a two-phase, experimental plan was initiated. The first phase consisted of a replication of Russell and Brandsma's test of their model, while the second phase was designed to compare treatment effectiveness in reducing anxiety, as well as to investigate the acquisition process of maladaptive emotional responses.

Basically, RET, classified here as a cognitive behavior-modification technique, views emotional upset (C) as a consequence of negative "self-talk" or beliefs (B) about an activating event (A), rather than as a direct result of the activating event. In other words, the self-talk at point B, often automatic and out-of-awareness, results

in emotional upset (C). The assumptions underlying this theory are viewed as paralleling those of cognitive behavior modification.

Russell and Brandsma postulate that RET involves the classical conditioning of previously neutral events (A) to emotional responses (C) by frequent pairings with negative self-talk (B). To test their model, Russell and Brandsma incorporated two independent variables--problem-relevancy and sentence-type--into a within-subjects design. Problem-relevancy, manipulated by the Coed Problem Checklist, involved the degree of personal relevancy of items on the checklist. The sentence-type variable consisted of sentence dyads created for each item (problem) on the checklist. The first sentence of the dyad was a factual statement about the problem, while the second statement was an emotive, affect-laden conclusion about the problem. Note that this procedure parallels the first two components of the ABCs of RET. Russell and Brandsma predicted an interaction between these two variables: Emotional responses to objective factual statements will differ in accordance with the personal relevancy of the statement--high arousal to high-relevant statements, low to low--but will always be high to emotive, affect-laden conclusions, regardless of relevancy. The dependent variable was emotional arousal, as measured by galvanic skin resistance, and the predicted interaction was obtained.

Phase I of the present study essentially replicated the Russell and Brandsma experiment. Fifty undergraduate females were randomly assigned to either a neutral sentence group (n=16) or an emotive sentence group (n=34). During Phase I, subjects, monitored by a polygraph machine, were instructed to read aloud sentence dyads presented via a

slide projector. For the neutral-sentence group, sentence dyads were of neutral and impersonal content, while emotive-sentence-group subjects read one high-relevant sentence dyad and one low-relevant sentence dyad (order alternated among subjects). The criterion variables were physiological responsiveness as measured by the polygraph. Hypothesis 1, that affective verbal stimuli are more emotionally arousing than neutral verbal stimuli, was tested using MANOVA and received support.

Hypotheses 2 and 3 concerned the interaction between problem-relevancy and sentence-type discussed above. Only the 34 emotive-sentence-group subjects were included in this repeated measures, multivariate analysis. The present study failed to obtain the positive support of these hypotheses found by Russell and Brandsma.

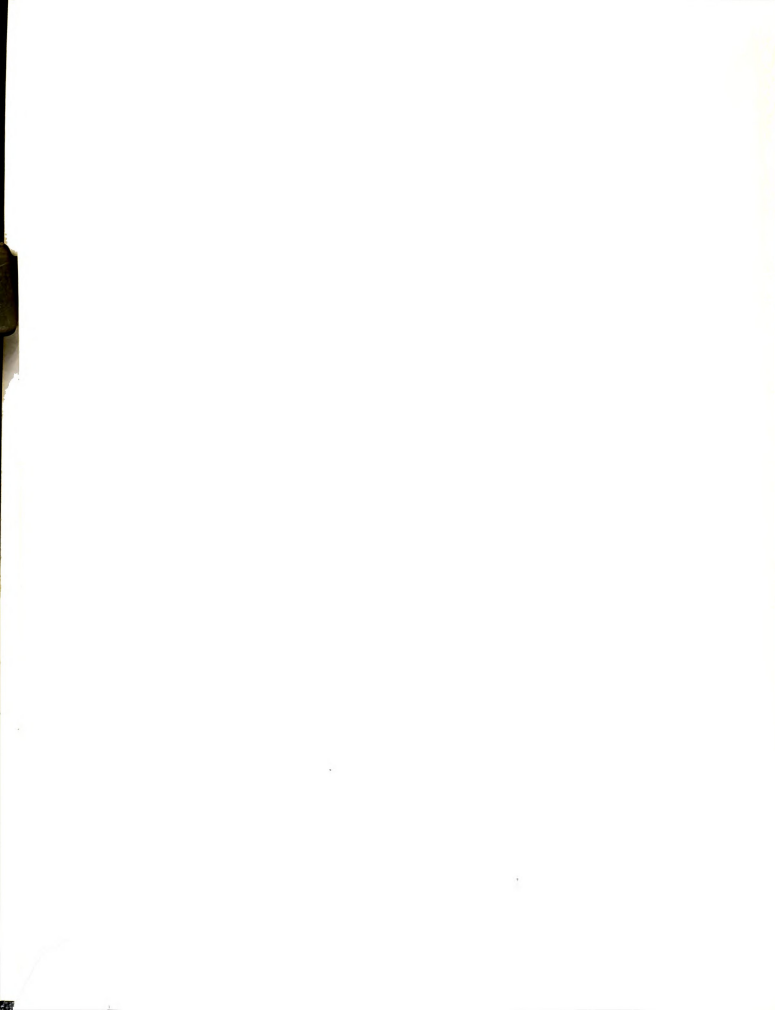
Phase II was intended to provide answers to questions concerning treatment effectiveness and the acquisition of emotional arousal to neutral verbal stimuli. Thus, the 50 subjects were reassigned to five treatment groups. Three treatments were directed at reducing emotional arousal to the high-relevant verbal statements discussed in Phase I, while for one group the goal was the reverse, namely to create emotional arousal to verbal statements of low personal relevancy. The three groups to reduce arousal were developed so as to approximate various cognitive behavior modification, language-conditioning therapies. Cognitive restructuring (an RET-like treatment) was compared to semantic desensitization (a verbal conditioning procedure designed to counter-condition meaning), verbal flooding (a semantic extinction procedure), and a no-treatment control group. Likewise, the negative semantic

conditioning group, in which an attempt was made to induce emotional arousal by pairing certain low-relevant words with negatively-loaded words, was also compared to the no-treatment control group. It was intended that Phase II be tested by a repeated measures MANOVA with a design over subjects. The analysis was to involve planned comparisons between the five Phase II groups. However, tests of hypotheses concerning the effectiveness of the analog treatment groups were contingent upon positive Phase I results. The negative results obtained in Phase I consequently rendered irrelevant the questions posed in Hypotheses 4 through 8.

A kind of performance anxiety may have affected subjects throughout the study and had the effect of obscuring the response differences to the various Phase I stimuli. If this was true, the question of whether the various treatments differ in their effectiveness in reducing performance anxiety might reasonably be posed. An analysis of this possibility, however, revealed no differences among the treatment groups. Furthermore, the three treatments were no more effective in reducing the hypothesized performance anxiety than a no-treatment control group.

In addition, the analyses of the negative semantic conditioning hypotheses yielded non-significant results.

The failure to achieve statistical significance for the majority of the present hypotheses was examined in the light of sampling, instrumentation, experimental manipulations, design and analysis, and theoretical considerations. The most probable non-theoretical explanations of the negative results appear to be: (a) the use of a



"non-clinical" sample and (b) an apparently poor manipulation of one of the independent variables--sentence type.

Several potential theoretical inadequacies in the Russell and Brandsma model were also discussed. That these inadequacies may account for the present negative results is a possibility. However, because the model was seen to be more incomplete than inaccurate, extensions of the model may provide a heuristic and useful example of the cognitive aspects of emotional arousal.

Suggestions for future research included: (a) solicit subjects who have "clinically" relevant (serious) problems; (b) individually tailor sentence dyads for each subject; (c) include in the experimental stimuli only those low-relevant concerns which are not likely to have emotive impact; and (d) individually package treatments for each subject.

Reference: Russell, P. L., & Brandsma, J. M. A theoretical and empirical integration of the rational-emotive and classical conditioning theories. Journal of Consulting and Clinical Psychology, 1974, 42, 389-397.

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have no doubt that this project would not have gotten off the ground, much less been completed, without his help.

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CHAPTER I

RATIONALE

Problem

In the last several years interest in the area of cognitive behavior modification (CBM) has mushroomed. Evidence of this burgeoning interest can be found in the periodical literature (e.g., the increase in cognitive-related articles in such behavioral journals as Behavior Therapy and the Journal of Applied Behavioral Analysis, as well as the establishment of the Cognitive Behavior Modification Newsletter), in books (e.g., Cognition and behavior modification, Mahoney, 1974; Imagery and daydream methods in psychotherapy and behavior modification, Singer, 1974), and conventions (viz., the First National Conference on Rational Psychotherapy and Cognitive Behavior Modification, Glen Ellyn, Ill., June, 1975). Such interest must be gratifying to those who have long argued for including cognitions in the study and modification of human behavior (Bandura, 1969; Beck, 1970; Cautela, 1967; Homme, 1965; Wolpe, 1958).

Until the arrival of CBM on the behavioral scene, however, the focus of behavior therapy had been upon the manipulation of the external environment as a means of modifying overt behavior. Both methodological and theoretical considerations kept behavioral approaches out of the "mental arena." But, as a methodology for studying cognitive processes developed (Danaher & Thoresen, 1972;



Homme, 1965; Mahoney, 1970), and as theoreticians such as Bandura (Bandura & Walters, 1963; Bandura, 1969) "legitimized" symbolic-mediational processes, empirical and practical interest grew. This interest prompted Mahoney (1974) to state that "the non-cognitive argument against behavior modification has lost its credibility" (p. 5).

Several CMB techniques that show considerable therapeutic promise focus primarily upon the language (verbal) as opposed to the imaginal aspects of cognition. Language, according to Staats (1972), "is one of the most powerful methods by which human behavior is controlled and changed" (p. 167). It is obvious that much of what a man does is a function of the verbal statements that others direct at him. People travel to unknown places, build sophisticated electronic equipment, and raise their children based upon the instructions of others. In addition to overt and written instructions, an individual's covert language system, or his "self-talk," also exerts extensive control over his behavior. In fact, Neichenbaum and Cameron (1974, pp. 263-290) assert that self-verbalizations are intimately related to one's ability to control his own behavior and emotions. Accordingly, therapeutic techniques which directly attempt to alter either internal verbal systems or the meaning of certain self-verbalizations would appear to offer not only a significant clinical strategy but also a means by which clients can come to gain positive control over their own behavior and emotion.

In spite of the increasing use of techniques which attempt to alter self-verbalizations as the basis for modifying inappropriate behavior and reducing maladaptive emotional arousal, empirical support

for these techniques is limited. Summarizing the experimental research evaluating the most widely used of these techniques, cognitive restructuring, Mahoney (1974) notes that it "has been sparse, methodologically poor, and summarily modest in its implications" (p. 182). Thus, clinical application far exceeds empirical support.

Purpose

The purposes of this study were (a) to investigate the effects of several kinds of self-verbalizations upon emotional arousal, (b) to compare the effectiveness of three CBM language techniques in reducing emotional arousal, and (c) to determine whether emotional responses to certain verbal stimuli can be conditioned.

More specifically, the first purpose was to replicate a study of significant theoretical import. Russell and Brandsma (1974) propose a classical conditioning model of rational-emotive therapy (RET) which can be viewed as representative of other CBM techniques as well. The model posits that certain words which are paired with unconditioned or powerfully conditioned stimuli become conditioned emotional stimuli. When these words are verbalized they elicit emotional responses. Moreover, as these now-emotive words are paired with neutral stimuli--situations, events, even other words and phrases--conditioning of the previously neutral stimuli takes place. Thus, situations, events, or self-verbalizations which appear to be non-emotive can elicit anxiety.

Russell and Brandsma's test of this model involved a clever operationalization of non-emotive and emotive self-verbalizations. The

results of their study support the proposed model. Inasmuch as that model presents an important conceptualization of several CBM techniques, and because their procedures provide a useful tool for studying clinically relevant linguistic variables, the first purpose of the study was to replicate their research.

Using some of the Russell and Brandsma procedures as a base, the second purpose of this study was to test the relative effectiveness of various language components of CBM in reducing emotional arousal. A laboratory analogue of cognitive restructuring (e.g., Goldfried, Decentecio, & Weinberg, 1974) was compared to semantic desensitization (Hekmat, 1972) and verbal flooding (a semantic extinction procedure designed as a control group for this study).

A third purpose of the study was to provide information about the acquisition of emotional arousal to verbal stimuli. This portion of the study was an attempt to validate the hypothesized conditioning of words in the Russell and Brandsma model. Further, because phobias are operationally defined as anxiety responses to stimuli, it was also intended to provide information about the acquisition of phobias. Moreover, if negative emotional conditioning is possible by exclusively verbal means, as attempted in this study, then treatment of maladaptive approach behaviors, such as sexual deviancy and drug and alcohol addictions, may be possible through language conditioning procedures. Again, relevant Russell and Brandsma procedures were employed in this effort.

The major criterion variable throughout the study was emotional arousal, defined as physiological responsiveness. Using this criterion

as the basis for comparison, it was expected that, in general, (a) Russell and Brandsma's results would be replicated; (b) the three language conditioning techniques would be more effective than a control group receiving no treatment, and would also differ among themselves in reducing emotional arousal; and (c) emotional arousal to previously neutral stimuli would be the result of negative semantic conditioning.

Theory and Related Research

This section will begin with a recapitulation of cognitive behavior modification. Particular attention will be given to the implicit assumptions of CBM and the literature supportive of these assumptions. Note that because this study is concerned with the cognitive modality of language, emphasis will be placed upon the language literature. Support for the CBM assumptions will provide a foundation for the techniques which are based upon them. In addition, a tentative taxonomy of CBM techniques will be offered as a means of relating the present focused interest of language techniques to the broader scope of CBM.

The major emphasis of the literature review will concentrate upon the Russell and Brandsma (1974) model of RET and related research, the three language techniques--cognitive restructuring, semantic conditioning, and verbal flooding--and the negative semantic conditioning procedure. Finally, since emotional (physiological) arousal serves as the criterion variable, a brief discussion of its validity and reliability will be presented.



Cognitive Behavior Modification

Although cognitive behavior modification constitutes a relatively new rubric within the behavioral literature, several surveys are now available (Cautela, 1973; Ellis, 1973(a); Jacobs & Sachs, 1971; Johnson & Elson, 1974; Mahoney, 1974; Meichenbaum, 1974; Rimm & Masters, 1974, chap. 10). These surveys are largely descriptive in nature, comparing and contrasting a variety of cognitive procedures. The criteria used to designate a specific technique as "cognitive behavior modification" appear to be that the technique (a) involves an explicit concern with thinking processes and (b) pays homage to learning theory as its theoretical base. Thus, clinical approaches as diverse as implosion (Stampfl & Levis, 1967) and coping-skills training (Goldfried, 1973, pp. 297-304) are included in the reviews.

In addition to a discussion of techniques, these surveys typically address themselves to several recurring issues. Generally, comments regarding the historical origins of CBM are included, and frequently B. F. Skinner is credited with giving the initial impetus to scientific investigations of "events within the skin" (Skinner, 1953). Since cognitive processes are of primary interest to traditional psychotherapists, a distinction is made between the assumptions and methods of CBM and traditional psychotherapy. Often, Mahoney's (1970) research criteria for the study of "coverants" or Beck's (1970) list of distinctive features are used to differentiate CBM from more traditional approaches. A major difference noted by Mahoney is that all behaviorally-oriented cognitive approaches involve mediational variables which are potentially observable (and thus scientifically



legitimate), as opposed to other mediating elements, e.g., the oedipus complex, which serve an explanatory function and are unobservable. Consequently, the assumptions, models, and techniques of CBM can be scrutinized in the public scientific domain, while the great difficulty in operationalizing the cognitive "intervening variables" of more traditional psychotherapy makes scientific investigation impractical.

Assumptions. Three basic CBM assumptions, often ignored in the surveys of cognitive techniques, will be identified, and, in the paragraphs that follow, empirical support for each will be presented.

The first and most crucial assumption is that behavior-environment relationships are extensively influenced by inferred mediational--cognitive--events. Note that this does not imply explanatory intervening variables. This assumption is invoked, for example, when a person withholds a response in the presence of a reinforcer (e.g., doesn't eat when hungry) or executes a response in spite of aversive consequences (e.g., works in a coal mine). In such cases the person is assumed to be responding to longer-range, cognitively-mediated consequences. Other examples of inferred mediation are the familiar situations in which individuals learn complex and lengthy behavior (e.g., learning to drive a car or speak a language) but appear to short-circuit the successive approximation process required for such learning by a strict operant conditioning approach. In these cases, behavior demonstrated by others is assumed to be the crux of the learning situation. Individuals observe others; then observations are "coded and stored in symbolic form for memory representation" (Bandura,

1971, p. 37). Later, these behaviors can be executed by the observer who simply visualizes or verbalizes the previously observed actions as a cue for his own behavior.

For those familiar with the literature, these examples illustrate the "inferred mediational" events with which behavioral self-control and social learning theory are concerned. To some extent, CBM has developed out of these two areas, and the interested reader is referred to that literature (Bandura, 1969, 1971; Goldfried & Merbaum, 1973) for extensive support of Assumption 1.

The second assumption implicit in CBM is that maladaptive behavior and emotional responses are frequently the result of dysfunctional cognitive processes. Stated from a language perspective, this assumption would be: Inappropriate self-verbalizations mediate maladaptive behavior and emotion.

To some extent, support for this assumption can be gleaned from empirical evidence for the first and third assumptions. (Assumption 3 states that the modification of maladaptive thought patterns will result in therapeutic behavioral and emotional change.) Using deductive logic, if (a) cognitions influence behavior and emotion, and if (b) altering cognitions will result in therapeutic behavioral and emotional change, then (c) certain cognitions must, therefore, "cause" maladaptive behavior and emotion.

Some research evidence, independent of this logical contortion, does exist. A direct experimental test of the effects of self-instructions on emotion was carried out by Velten (1968). Subjects were asked to read a series of 60 self-referent statements, presented



individually, which progressed from relative mood-neutrality to "elation" or "depression," depending on the group to which the subject had been assigned. Subjects in the elation group read statements such as, "This is great--I really do feel good--I am elated about things," while the depression group subjects read statements like, "Every now and then I feel so gloomy that I'd rather just sit than do anything." After the mood-induction treatment, subjects were asked to participate in seven different performance and verbal tasks on which they had been pretested. On five of the seven tasks, the treatment groups differed significantly in the predicted direction. Pre-post-comparisons indicated that mood and subsequent performance on tasks changed as a function of the statements read. Since experimental demand characteristics and subject awareness were adequately controlled for, the obtained results indicate that emotional and behavioral responses can be dramatically influenced by self-verbalizations.

Rimm and Litvak (1969) also tested the effects of self-instruction on emotional arousal. Predicted differences in respiration rate and depth between subjects who read affective self-statements and those reading neutral statements were obtained. Although differences were not obtained on galvanic skin response measures, the experimenters conclude that this basic tenet--assumption 2--of CBM is supported by their findings.

Additional support, though indirect, can be found in the studies which test Schacter's theory of emotion (London & Nisbett, 1974(a), pp. 13-24; Nisbett & Schacter, 1966; Schacter, 1964, pp. 49-80; Schacter & Singer, 1962). Basically, the theory states that the



specific emotion experienced by a person is the function of (a) physiological arousal and (b) self-verbalizations, i.e., interpretations, about that arousal. In the now classic Schacter and Singer (1962) study, subjects were injected with epinephrine, a drug which produces marked autonomic arousal, and exposed to experimental confederates exhibiting "anger," "joy," or no emotion. Some subjects were accurately informed about the effects of the drug, while others were not. Informed subjects were less influenced by the confederates than were uninformed subjects, who generally behaved consistent with the stimulus situation; i.e., if with an angry confederate, they behaved angrily. Schacter and Singer suggest that informed subjects attributed their arousal to the effects of the drug and not to the social situation. Inasmuch as this attribution, or labeling, process likely involves self-verbalizations (Meichenbaum, 1974, p. 3), the Schacter and Singer study can be viewed as supporting the second CBM assumption.

Further evidence from the "attribution" literature also supports the contention that self-talk can yield maladaptive emotion. Farnia, Gliha, Bondreau, Allen, and Sherman (1971) found that mental patients who believed that strangers in their presence knew of their status as mental patients tended to feel less appreciated, found a task more difficult to perform, and were perceived as being more tense and anxious than were patients not holding such a belief. Although specific self-verbalizations were not recorded, it is tempting to speculate which patients engaged in negative self-talk. Another attribution study reported by Glass and Singer (1972) indicates that subjects believing they could terminate a loud, harsh noise performed better at



several tasks than did subjects who believed the noise was uncontrollable. Again, the different kinds of self-talk (belief) engaged in by the subjects and the respective consequences are predictable.

The third and most clinically relevant of the CBM assumptions is: Modification of thought patterns will result in therapeutic behavioral and emotional change. This assumption has a good deal of face validity. Consequently, modern writers such as Dale Carnegie (1948), Norman Vincent Peale (1960), and Napoleon Hill (1966) have successfully advocated "autosuggestion" as the means to social prominence, happiness, and riches. Yet, empirical support for this assumption is relatively recent.

Much of the early work on self-verbalization has focused on the development of language in children (Bem, 1967; O'Leary, 1968; Palkes, Stewart, & Kahna, 1968). An example of these early studies was Meichanbaum and Goodman's (1969) investigation of Luria's (1961) hypothesis that children learn to control their own behavior through a developmental sequence in which the verbal instructions of others are gradually internalized. Using the simple operant motor response of finger-tapping, these researchers found that influencing the speed of the finger-tap response by covert self-verbalizations was a function of the age of the child. Younger children were able to alter the speed of finger-tapping appropriately when instructed by adults but could not alter finger-tapping speed using overt or covert self-instructions. Older children, on the other hand, were able to control their responses by covert (sub-vocal) self-instructions.



Based on these findings, Meichenbaum and his associates investigated the clinical utility of teaching people how to control their own behavior by self-instruction. A treatment package which was subsequently successful with problem smokers, impulsive children, and schizophrenics was developed (Steffy, Meichenbaum, & Best, 1970; Meichenbaum & Goodman, 1971; Meichenbaum & Cameron, 1973). The self-instruction procedure involves five training steps. In the first step, the therapist models task-relevant self-instruction by talking out loud as he performs a task. Next, the subject performs the task while the therapist instructs him aloud. The client then performs the task himself, first using audible self-instructions, then whispered self-instructions, and, finally, covert self-instructions. This procedure was superior to a variety of control groups included in the three studies.

Other client populations may not be deficient in self-instructions but may use self-instructions in maladaptive ways, as Ellis (1962) has suggested. Altering, rather than developing, self-instructions thus becomes the goal of treatment. Meichenbaum and Cameron (1974) used a five-step procedure similar to that described above to enhance creativity in college students whose use of negative self-instructions and evaluations apparently inhibited their creative abilities. Similar procedures have been used successfully with speech- and text-anxious students (Meichenbaum, 1972; Meichenbaum, Gilmore, & Fedoravicius, 1971; Weissberg, 1975), with children afraid of the dark (Kanfer, Karoly, & Newman, 1975), and to control disruptive classroom



behavior (Blackwood, 1970). Thus, the notion that "private speech" can modulate behavior and emotion appears to be well established.

Another source of support for the third assumption of CBM is found in the semantic conditioning literature. However, the goal of semantic conditioning is to alter the meaning of emotive words rather than to decrease the frequency of debilitating self-instructions. This body of literature will be reviewed later in this chapter.

The rather extensive review of the research supporting the CBM assumptions has been presented because of its relevance to the purposes of the study. Insofar as the assumptions are supported, the techniques upon which they are based receive support. And, taken together, the controlled outcome studies described above provide convincing evidence for the validity of the implicit assumptions of CBM.

Classification of techniques. One problem illuminated by the CBM surveys discussed earlier in this section is the lack of a conceptual and theoretical framework with which to systematically and consistently categorize the various CBM techniques. For example, Johnson and Elson (1974) have classified the techniques in terms of the target behaviors, i.e., maladaptive approach or avoidance behaviors, while Tryon (1974) suggests that the underlying learning processes, i.e., operant or respondent, be used as a classification scheme.

Mahoney (1974), who has provided the most extensive and informative review of CBM, suggests a three-model, mediational classification: (a) covert conditioning, based on the assumption that overt and covert behaviors are functionally identical (the continuity assumption); (b) information processing, which has, thus far, failed to



produce therapeutic procedures; and (c) cognitive learning, which attempts to extend the continuity assumption, to include, among other things, attribution theory (London & Nisbett, 1974[b]), self-perception theory (Bem, 1970), and social learning theory (Bandura, 1971). This kind of classification scheme is extremely helpful as a means of conceptualizing the plethora of cognitive techniques.

One possible categorization dimension is notable for its absence, namely, the kind of cognitive activity utilized in particular therapeutic strategies. Mahoney (1974; Thoresen & Mahoney, 1974) has been particularly outspoken in pointing to the need to isolate the critical cognitive components of various techniques as a means of enhancing both their utility and efficiency. A components research strategy emphasizing not only a comparison of different kinds of cognitive activity but also a comparison of techniques within a particular cognitive modality suggests a classification system based upon the kind of cognitive activity to which techniques are addressed.

One broad categorization, for example, could involve a visual-auditory continuum. Another might circumscribe a verbal versus imaginal dimension. Thus, techniques directed at altering meanings of words or self-statements could be classified as verbal or language techniques, while those attempting to influence pictorial scenes, to include all five senses, could be classified as imaginal. It is recognized that cognitive activity is highly complex and that such a dichotomy is not at all clear-cut. For example, it seems likely that self-verbalizations elicit imaginal cognitive activity, while images may give rise to sub-vocalizations. Accordingly, a dynamic, reciprocal



interaction among verbalizations and other covert activity would demand a more sophisticated classification system. However, insofar as certain techniques are explicitly concerned with specific kinds of cognitive activity, such a categorization may be both elucidative and heuristic and is cautiously presented in Table 1.1. This table will be helpful as the techniques of interest to the present investigation are discussed.

Table 1.1

List of Cognitive Behavior Modification Techniques
According to Kind of Cognitive Activity

Language Techniques	Imaginal Techniques
Cognitive restructuring	Covert conditioning (Cautela, 1971)
Covertant conditioning (Homme, 1965)	Covert modeling (Kazdin, 1973)
Rational-emotive therapy (Ellis, 1962)	Covert sensitization (Cautela, 1967)
Self-instruction (Meichenbaum, 1974)	Emotive imagery (Lazarus & Abramovitz, 1962)
Semantic conditioning (Hekmat, 1972)	Implosion (Stempfll & Levis, 1967)
Stress inoculation (Meichenbaum, 1974)	Systematic desensitization (Wolpe, 1958)
Thought-stopping (Wolpe, 1958)	

Summarizing the literature on CBM, it is clear that its basic assumptions enjoy considerable though largely indirect support from a variety of sources. The notion that environmental inputs and behavioral outputs are moderated by empirically investigatable cognitive processes

seems well established. It is also evident that certain thoughts can result in maladjustive behaviors and emotions. Hence, the effort to alter cognitive behavior as a means of effecting therapeutic change appears to be highly appropriate. Furthermore, clinical efforts along this line have received some tentative support from the empirical literature--"tentative" because the variety of clinical techniques subsumed under the CBM rubric vary widely in procedure and emphasis, making broad generalizations about the results of the scant comparative group studies which are available difficult.

It is important now to begin asking questions about the effectiveness and efficiency of specific cognitive behavior modification techniques. Tests of the empirical adequacy of theoretical models attempting to parsimoniously describe the techniques and investigations of the components of these models is an appropriate initial strategy (see London, 1972, for a discussion of the function of models in the behavioral sciences). Such a strategy will help to guide research and ultimately to refine clinical practice. One model of particular interest to the present study is presented below.

Russell and Brandsma's Model of RET

Russell and Brandsma (1974) have proposed a classical conditioning model of rational-emotive therapy (Ellis, 1962). A brief review of RET will be presented before the model is reviewed.

Although Albert Ellis was psychoanalytically trained (Patterson, 1973, chap. 3), he has gravitated, largely via Alfred Adler, to his present position, which is frequently classified as a behavioral



approach (e.g., Meichenbaum, 1974; Rimm & Masters, 1974, chap. 10).

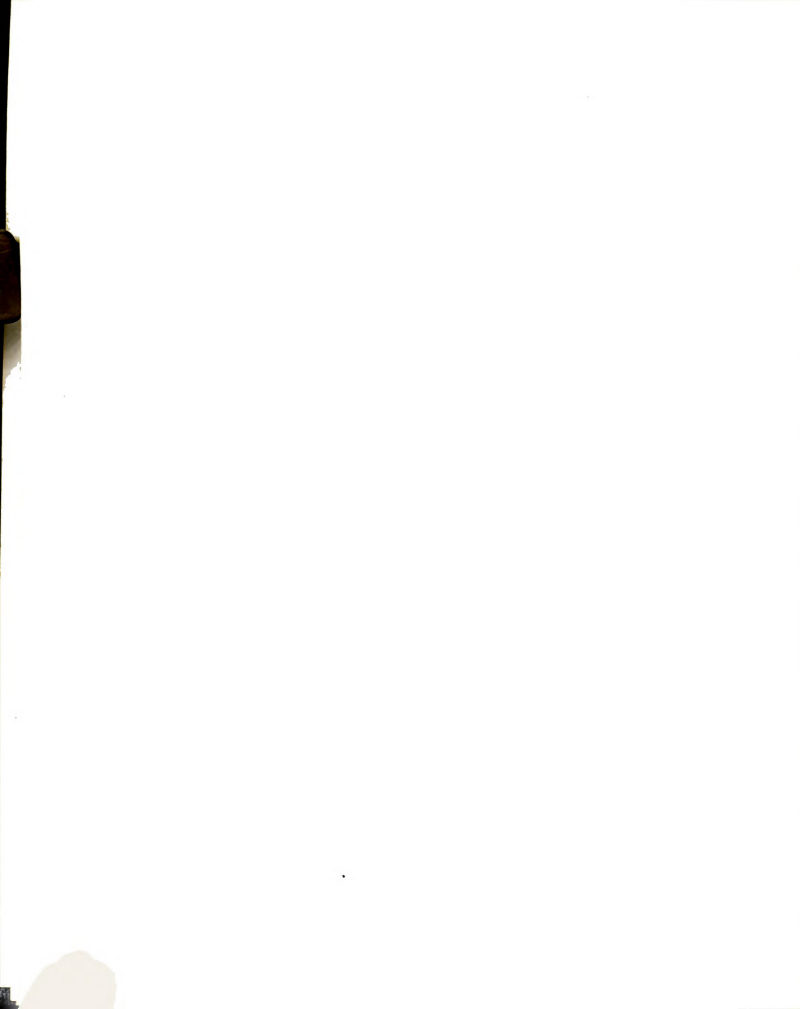
Basically, Ellis assumes that emotions are influenced by thoughts:

It would appear, then, that positive human emotions, such as feelings of love or elation, are often associated with or result from internalized sentences stated in some form or variation of the phrase, "This is good for me!" and that negative human emotions, such as feelings of anger and depressions, are associated with or result from sentences stated in some form or variation of the phrase, "This is bad for me!" (1962, p. 51).

This statement parallels the first CBM assumption discussed above.

Because dysfunctional thoughts may mediate debilitating emotions (CBM's second assumption), Ellis' therapeutic approach is directed at altering an individual's self-defeating thoughts as a means of changing undesired emotional states (CBM's third assumption). More specifically, Ellis proposes an ABC theory of human functioning. A represents a real, objective event (to include verbalizations) to which an individual is exposed. B refers to evaluative self-statements concerning A; and C involves the individual's response to B. People are often unaware of the B portion of this paradigm and view their emotional upset as a direct result of the objective event at point A. The purpose of rational-emotive therapy, then, is to explicate the automatic self-statements at B and change them through rational arguments and logical attacks, thereby reducing emotional arousal.

In elaborating this ABC theory of emotion within a classical conditioning framework, Russell and Brandsma propose a three-stage developmental model. During Stage 1, A (an objective stimulus complex) is a neutral stimulus. B includes the negative emotive vocabulary which functions as the conditioned emotional stimulus, while C is the conditioned emotional response.



Stage 2 represents the conditioning process in which the emotional disturbance is acquired. In this phase, the neutral A stimulus complex is paired with B, the conditioned emotional stimulus. Russell and Brandsma view this pairing as an irrational process, irrational because the conditioned emotional stimuli are applied needlessly to the formerly neutral event. This association of A with B may result from cultural, social, or accidental pairings, but whatever the conditioning source the effect is the same--to change the valence of the A stimulus.

The final phase of this process is reached in Stage 3. As the result of Stage 2 conditioning, A has become a second- (or third-, etc.) order conditioned emotional stimulus, capable of eliciting the conditioned emotional reaction, C. In Stage 3, the original conditioned emotional stimuli, B, have become "habitual and implicit" (p. 390) and are no longer a noticeable part of the verbal sequence.

In fact, once Stage 3 is reached, the entire ABC sequence occurs almost simultaneously. Thus, individuals are unaware of the effect of their own self-verbalizations in eliciting emotional arousal.

Russell and Brandsma view the task of RET to be directed at "deconditioning" the association between the previously neutral A stimulus and the implicit, negative verbalizations of B. Successful therapy results in the previously neutral stimuli becoming neutral (i.e., they do not elicit a conditioned emotional response) once again. In other words, the individual no longer responds to the neutral stimulus A with the irrational self-talk of B.

To test this classical conditioning model of RET, Russell and Brandsma developed a problem rating list and a pair of related A (neutral) and B (emotional) statements for each item on the checklist. That is, the A sentence was an objective, factual statement about the problem rating list item, while the B sentence was a conclusion about A which contained emotive and negatively-valenced words. For example, A: "I put in a lot of time and effort studying, but my test grades are not very high"; B: "My study habits are terrible . . . I'll never learn to study, it's hopeless . . . I get so depressed, I'll probably flunk out."

The checklist was used to isolate significant as well as trivial problems, while the statement pairs simulated the A and B parts of the model. The experimenters assumed that subjects reading insignificant problem dyads would respond as if they were at Stage 1 of the model. That is, their response to A, a neutral stimulus, would be minimal, while a conditioned emotional response would occur to B, a conditioned emotional stimulus. On the other hand, subjects reading statement pairs which involved significant problems would respond as if they were at Stage 3 of the model. A conditioned emotional response would occur to A--now a second-order conditioned emotional stimulus--as well as to B.

Emotional arousal was defined as respiration rate, respiration depth, and galvanic skin response (GSR). Support for their model was obtained on the major physiological variable--GSR. It must be noted, however, that Russell and Brandsma discarded the respiration variables after finding that they did not differentiate neutral and emotive



sentences. From a statistical standpoint, the consequence of ignoring some of the variables in a system of dependent variables and analyzing only the remaining variables is to inflate the possibility of obtaining significant differences when none exist. That is, the possibility of a Type I error is enhanced (as with multiple t tests). In this case Russell and Brandsma argue that respiration was a poor measure of emotional arousal. Reading sentences aloud required subjects to control their breathing to some extent. In turn, the voluntary control of respiration interfered with the accuracy of the measure as an indicator of emotional arousal. This explanation seems reasonable, and inasmuch as skin resistance was significant in the direction of their hypothesis, support for their model was obtained.

Since Russell and Brandsma did not attempt to reduce or treat emotional arousal, their study cannot be viewed as supporting rational emotive therapy. However, it does lend support to the assumptions of RET, and, based on the results of this study, the general goal of RET, viz., to reduce emotional disturbance by changing self-verbalization appears to be a reasonable one.

Rational-emotive therapy supportive research. A review of the RET literature is included here for two reasons. First, for the purpose of this study, it was important to determine the extent to which the Russell and Brandsma model is a good example, i.e., explains the facts, of RET as a therapeutic strategy. What these "facts" are, will be discussed in the literature review. Second, this review is relevant because one of the language techniques investigated in the present



study is partially based on RET principles. Also, the review may suggest the RET components which require further investigation.

Much of the support for RET is indirect. That is, the assumptions--which parallel those of CBM in general--appear to be well founded. Other than the Russell and Brandsma research, Velten's (1968) mood-induction study and Rimm and Litvak's (1969) study concerning the effects of self-verbalizations upon emotional arousal seem particularly relevant. However, comparative group studies of RET are both infrequent and equivocal.

Ellis' (1957) comparison of 78 of his psychoanalytic patients with 78 patients treated by RET is subject to gross assessment biases, as well as sampling errors (evaluations were made over a several-year period). Another early study of RET was Karst and Texler's (1970), who attempted to reduce speech anxiety with either an RET procedure or Kelly's (1955) "fixed-role therapy." Differences between these two approaches and a no-treatment control group were not obtained on two behavioral measures. However, on three of the five measures, RET and "fixed-role therapy" significantly reduced subjective speech anxiety. Unfortunately an attention placebo group was not included, so experimental demand characteristics cannot be ruled out as an explanation for the results.

In a partial replication of their first study, Trexler and Karst (1972) compared RET to a relaxation training procedure (attention placebo) and a no-treatment control. Following the first administration of treatment, the relaxation and no-treatment controls received RET. For statistical analysis, the RET and no-treatment



(RET during the second administration) groups were combined and compared to the relaxation group's results before that group had received RET training. The purpose for this kind of analysis is unclear, and subsequent favorable outcome for RET must be questioned. The authors also analyzed pre- to post-, RET-treatment change scores for all groups, and, although a significant reduction in anxiety was noted for all subjects, the lack of an untreated comparison group obscures the results. The most meaningful analysis performed by these researchers was after the first administration of group treatments. That analysis reveals that no differences between groups were obtained on the three behavioral measures; RET was superior to both groups on two subjective measures, while the relaxation group was superior to the others on one subjective measure. Although equivocal, these results were seen as confirming the effectiveness of RET in reducing speech anxiety.

Similar results were obtained by Jarmon (1972), who compared the effectiveness of live versus written (bibliotherapy) RET in reducing speech anxiety. An attention placebo and no-treatment control group were included. As in the Trexler and Karst studies, behavioral changes were not obtained, while on several of the subjective anxiety measures, bibliotherapy proved superior to the other groups.

An ambitious study comparing RET, systematic desensitization, client-centered therapy, attention placebo, and no-contact control was attempted by DiLoreto (1971). After eight weeks of treatment, therapists evaluated RET subjects as having made the most gains in reducing interpersonal anxiety, while subjective anxiety ratings favored the systematic desensitization group. One limitation of this study was the

lack of behavioral measures. Additionally, individual counselor styles may have affected the results.

Two early studies using physiological dependent variables obtained results favorable to RET. In a study summarized by Rimm and Masters (1974, p. 429), Maes and Heiman (1970) compared the effectiveness of RET, client-centered therapy, systematic desensitization, and a no-treatment control in reducing test anxiety. After 10 training sessions, the participating high school students were administered a non-school-subject test. Heart rate and GSR were significantly reduced for RET and desensitization subjects, although no differences were obtained on subjective anxiety. Burkhead (1970) investigated the effects of RET in reducing experimental anxiety, created by exposing subjects to tones with the expectancy of a one-in-five probability of shock. As measured by GSR, significantly greater anxiety reduction was obtained by RET subjects--both personal and taped therapy sessions--than by a taped negative RET group ("designed to reinforce the subjects' irrational beliefs," p. 100) or a no-treatment control group. The clinical implications of these two studies are limited, however, by the artificial nature of the anxiety-provoking situations.

The recent research by Moleski and Tosi (in press) offers the only well-controlled and clinically-relevant comparative study of RET. Stuttering was the target behavior, and the effects of RET were compared with systematic desensitization and a no-treatment control. Additionally, the effect of "in vivo" behavioral tasks as part of therapeutic training was also investigated. Criterion measures were attitudinal, affective, and behavioral. The results unequivocally



support RET--both with and without "in vivo" behavioral tasks as part of training--on all three criterion measures. Most significantly, RET was more effective in reducing speech dysfluences than systematic desensitization. The researchers suggest that a RET approach to stuttering should be considered over a traditional behavioral approach.

Conclusions about the RET research. The experimental research evaluating the efficacy of RET has been limited in scope and quality. Several of the studies suffer from inadequate controls, while others fail to include reliable performance measures. In addition, researchers have tended to rely on speech-anxious or test-anxious subject populations. Based on the literature presented in this survey, an evaluation of RET would be premature. One difficulty in making evaluative conclusions may be that components of RET have not been adequately analyzed. In addition, the scope of target behaviors limits generalizations. The survey of related language techniques which follows will provide a broader evaluative base, and a tentative evaluation of RET and related literature is presented at its conclusion.

Language Conditioning Techniques

The three language techniques of interest to this study are presented below. Each is a CBM technique, each can be viewed as conforming to the Russell and Brandsma model, and each contains elements of RET.

Cognitive restructuring. Cognitive restructuring (CR) appears in the literature as a label for a variety of cognitive-behavioral techniques. Mahoney (1974, chap. 11) uses the term as a synonym for



RET. Lazarus (1974, p. 101) describes CR as an action therapy that teaches a client "constructive alternativism"--essentially by altering misinterpretations of anxiety-producing situations and cognitively rehearsing alternative responses to those situations. For one group of researchers, CR is the name given a verbal extinction and relabeling procedure (Wein, Nelson, & Odom, 1975), while Baker (1966) calls CR "verbal instructions using reason and information processing." On the other hand, CR would be a proper label for several other cognitive techniques (e.g., systematic rational restructuring, Goldfried, Decentecio, & Weinberg, 1974; cognitive relabeling, Goldfried & Merbaum, 1973, p. 17; cognitive therapy, Beck, 1970).

Although specific cognitive restructuring procedures vary, they all (a) include the assumptions of cognitive behavior modification, (b) are basically linguistic (as opposed to imagery) approaches, and (c) attempt to modify cognitive sets (global verbal behavior, e.g., irrational assumptions as in RET) rather than single words or phrases. As used in this study, CR is operationally defined in Appendix D. Briefly, individuals in the CR treatment group listened to a tape recording presenting the ABCs of RET. In addition, an opportunity to generate and practice alternative self-statements was provided. Thus, the present use of CR can be viewed as an analog of RET plus a cognitive relabeling/rehearsal component.

For the most part, then, a survey of relevant cognitive restructuring literature has already been presented. Two related comparative group studies, however, have a bearing upon RET-type approaches and are presented below.



D'Zurilla, Wilson, and Nelson (1973) included CR as a control group in their study comparing systematic desensitization and graduated prolonged exposure in reducing fear of dead animals. Graduated prolonged exposure was an imaginal procedure similar to implosion (Stampfl & Levis, 1967), in that each level of a dead animal hierarchy was imagined until the subject's anxiety dissipated (rather than stopping the image when anxiety was detected as in systematic desensitization). The CR control group included five control components: (a) interpersonal interaction, (b) a rational explanation of the fear of dead animals, (c) expectation of benefit, (d) unsystematic attention to details related to dead animals, and (e) encouragement to "perceptually relearn" or relabel fear of dead animals. (Note the similarity to RET.) The results of the study surprised the authors. The control group, CR, was superior to both experimental treatments in reducing subjective anxiety (although graduated prolonged exposure was superior in a behavior avoidance test). It is significant that, on at least one measure of anxiety, a language technique proved to be more effective than imaginal techniques.

In a follow-up of this study (Wein et al., 1975), CR was viewed as involving two component parts: (a) verbal extinction (subjects "engaged in long verbal exposure to past threatening situations," p. 460) and (b) relabeling ("of anxiety-provoking stimuli, so as to provide a rational explanation for the development of fear," p. 460). Of particular interest to the investigators were the relative contributions of verbal extinction vs. the reattribution (relabeling) process in CR. In addition to a verbal extinction and CR group,



systematic desensitization, attention placebo, and no-treatment control groups were included. Dependent variables were behavioral, subjective, and physiological (heart rate) measures of fear of snakes. Six treatment sessions for each experimental condition were conducted. Wein et al. found that CR was as effective as systematic desensitization in reducing behavioral avoidance and more effective in reducing subjective anxiety. Again, a language versus imaginal approach proved superior. Further, verbal extinction was found to be a somewhat facilitative aspect of CR in reducing emotional arousal. Heart rate differences, however, were not obtained among the groups.

Meichenbaum's studies on self-instructional treatment packages discussed earlier in this chapter are also pertinent to CR. In fact, self-instructional or "stress-inoculation" procedures, as Meichenbaum refers to them when applied to anxiety, are strikingly similar to RET. Meichenbaum emphasizes systematic, graduated skill-building, while Ellis appears to rely primarily on Socratic questioning and the client's self-examination. Regardless of these minor differences, the Meichenbaum procedures can be viewed as a cognitive restructuring or RET-like approach. Thus, research evidence supporting self-instruction and stress inoculation can be taken as support for CR as well.

Clouding the evidence for the effectiveness of self-instructional strategies, however, is a recent study by Robin, Armel, and O'Leary (1975). These authors investigated the effects of self-instruction in remediating the writing deficiencies of a group of 5- and 6-year-olds. Although, as compared with a direct training and no-treatment control group, self-instruction plus direct training proved modestly superior



in improving writing skill, the authors conclude that self-instruction is a cumbersome and time-consuming procedure. They note that in many cases self-instructions were eclipsed by the children or were not in concert with the child's writing. Further, some children self-instructed properly, as they wrote poorly. They conclude: "Claims that self-instruction facilitates generalization and provides clinically useful increments in the effectiveness of behavior modification techniques with children seem premature" (p. 186).

It might be reasonable to assume that these authors' concluding comments are relevant to self-instructional procedures but not to the stress-inoculation use of self-instruction which Meichenbaum (1974) has proposed. In any event, this study points to the need for careful investigations of the effective cognitive components, as well as the kinds of behaviors and populations with which self-instruction is effective.

Semantic desensitization. Pairing words to modify emotional responses to stimulus objects appears to be an elementary, if not naive, approach to clinically relevant problems. Yet, Hekmat (Hekmat & Vanian, 1971; Hekmat, 1972; 1973) has taken precisely that approach: "If higher order semantic conditioning processes are involved in the acquisition of fear, then desensitization procedures based on counterconditioning of meaning can serve to counteract fear and modify phobic behavior" (Hekmat & Vanian, 1971, p. 248).

In a laboratory-type setting, Hekmat asked subjects to repeat a positive evaluative word stated by the experimenter immediately after the stimulus word was presented. (The procedure varied slightly among

the studies; e.g., subjects were asked to imagine words together vs. hearing and saying words together.) Over 100 classical conditioning trials were employed, and, during the test phase, subjects reported less fear and exhibited greater approach responses to snakes, spiders, and rats than did control subjects. Furthermore, in the one study which compared treatments (Hekmat, 1973), semantic desensitization (SMD) was as effective as systematic desensitization and more effective than implosion. Additionally, it appears to be a much more efficient strategy than either.

Hekmat's work is based largely on Staats' analysis of and hypotheses about the role of language in human functioning. Staats (1968) has proposed an A-R-D (attitude-reinforcer-discriminative) system of language. Basically emphasizing both the eliciting and cueing functions of words, as well as their reinforcing potency, he maintains that much of human behavior is under the control of previously acquired language repertoires. He asserts that behavior and emotional change can be effected solely by altering the positive and negative valences of words which represent objects or people (Staats, 1972). (Dollard & Miller, 1950, have made similar hypotheses and speculations.)

There is much research evidence to support Staats' contentions. His own early work in semantic conditioning is an example. By pairing words having positive meanings with certain national names, or with familiar masculine names, Staats and Staats (1958) were able to positively alter attitudes toward these national and masculine names, as measured by responses to an Osgood semantic differential scale. Likewise, attitudes toward national and masculine names paired with negatively-valenced words were altered in a negative direction.



In a more clinically relevant study, Early (1968) investigated the possibility of increasing the approach behavior of fourth and fifth grade children toward classroom isolates by pairing the isolates' names with positive-evaluative words. To obscure the purpose of the experiment, the children were told that they were participating in a study on memory. The children were requested to memorize pairs of words. In the experimental group, the name of an isolate served as one of the stimulus words and was paired with a positively-valenced adjective. Names of other children, also stimulus words, were paired with non-evaluative or neutral words. In the control group, all names were associated with non-evaluative words. Although sociogram responses were not significantly altered by the verbal conditioning procedure, the experimental group participants' behavior toward the isolates changed dramatically in a positive direction.

Another base of support for the Staats and Hekmat procedures is found in the other kind of cognitive behavior modification (see Table 1.1). The contiguous association of images has been used successfully by behavior therapists for years. Procedures such as systematic desensitization (Wolpe, 1958), emotive imagery (Lazarus & Abramovitz, 1962), implosion (Stampfl & Levis, 1967), and covert conditioning (Cautela, 1971, pp. 109-130) are directed toward fostering behavior and emotional change by having clients juxtapose imaginal events. Semantic desensitization of words would appear to offer clinicians a more pragmatic strategy.

Verbal flooding. Although the verbal flooding (VF) procedure used in this study was designed to be a control group (to control for



verbal extinction in the CR and SMD treatment groups), there is some evidence to support its possible efficacy as a legitimate therapeutic strategy. (Verbal flooding is a conditioning procedure in which stimulus words are paired with neutral--rather than positive--words; therefore, it is an extinction as opposed to a counter-conditioning procedure.) First, from a theoretical standpoint, if a conditioned stimulus is presented in massed extinction trials, i.e., without the unconditioned stimulus, the conditioned response eventually extinguishes (Kimble & Kendell, 1953). Thus, if certain words which have emotive properties are presented in a massed fashion over a short period of time, the conditioned emotional response should extinguish. Second, evidence exists that such a procedure can be an effective means of reducing anxiety in animals (e.g., Polin, 1959). Third, variations of a flooding procedure using imagery have also received empirical support, e.g., implosion (Stampfl & Levis, 1967) and systematic desensitization (Wolpin & Raines, 1966). Finally, the research of Wein et al. (1975) suggests that verbal extinction has some facilitative potency over and above CR in reducing subjective anxiety.

Summary of language techniques. The parallels between RET, CR, SMD, and VF are clear. All four are basically verbal strategies; they make the same assumptions, have similar goals, and have been characterized by the same model (classical conditioning). Differences exist, for the most part, in the structure and frequency of client-counselor interaction. The RET and CR strategies involve attacking maladaptive emotional responses on the basis of rationality, persuasive logic, and alternative assumptions. It is assumed that subsequent



improvement is a direct result of newly-acquired rational thinking (cognitive sets). It may be, however, that CR works because of new and frequent verbal pairings or through verbal extinction. If this were the case, rational arguments as a means of altering self-instructions might be abandoned in favor of language conditioning procedures. Researchers have thus far failed to explore this possibility. Thus, experiments designed to isolate certain verbal components of the rational arguments and compare the therapeutic processes and outcomes of the various components might vastly improve treatment strategies.

Negative Semantic Conditioning

Staats (1972) notes that significant theoretical and empirical contributions could be made through investigations of the origins of phobias and other maladaptive emotional responses. He suggests a semantic conditioning procedure similar to Hekmat's be used to develop laboratory emotional arousal. Such a procedure would have theoretical significance in that it would support Phase II of the Russell and Brandsma model. The clinical utility of this kind of research would be to help establish an efficient technology for developing avoidance responses to inappropriate approach objects, e.g., as with alcoholics or sexual deviates.

There are several pieces of evidence indicating that a semantic conditioning technique of this kind is both feasible and potentially useful. In one laboratory study, Phelan, Hekmat, and Tang (1967) trained subjects to associate nonsense syllables with wooden blocks. Some syllables were then paired with unpleasant words in a



procedure similar to Staats and Staats (1957). When subsequently asked to select the blocks that they liked the most, subjects avoided significantly more blocks that had been associated with the negative label.

In another study investigating how attitudes toward certain names can affect behavior toward people bearing those names, behavior changes, as well as semantic differential scores, were altered in a negative direction. Berkowitz and Knurek (1969) trained subjects to dislike a given name by pairing it with words having unfavorable connotations. Later, the subjects participated in a three-way discussion and generally acted more unfriendly toward a negatively-named person than toward a person bearing a neutral name.

That this simple pairing of words--neutral with negative--can evoke avoidance responses to objects or people associated with the negative words is surprising and significant. One is tempted to speculate that attitudes (or at least verbal behaviors) might often change before overt behavior changes.

Investigators have also conditioned autonomic responses to words which were originally neutral for the subjects. Brotsky (1968) used white noise as an unconditioned stimulus, and Proctor and Malloy (1971) employed electric shock. Both obtained GSR responses to the previously neutral verbal stimuli. Although negative words were not employed as conditioning stimuli, these studies lend support to the hypothesis that words can acquire negative valence through classical conditioning procedures.

A clinical language technique that bears striking resemblance to the negative semantic conditioning proposed here is one originally suggested by Homme (1965). He asserts that by increasing particular kinds of self-verbalizations--coverants--an individual can alter his own behavior. For example, thoughts of lung disease or cancer can elicit strong emotional fear reactions. By increasing thoughts which make smoking undesirable, smoking should decrease. Note that this procedure pairs labels for particular objects or activities, e.g., "smoking," with negatively-valenced words, such as "causes cancer." Homme's procedure appears to differ from semantic desensitization in the way in which the strategy is used to increase the frequency of these verbal pairings.

That is, coverant conditioning is based on operant conditioning principles--punishment and subsequent escape/avoidance behavior--and is intended as a self-control strategy, while negative semantic conditioning (NSC) is a classical conditioning procedure and is "administered" by an experimenter. Nevertheless, the parallels between the two techniques suggest further investigation and expansion of the clinical potential of an NSC-type procedure.

Emotional Arousal

Because the present study involved a replication of the Russell and Brandsma study, the dependent variable of emotional arousal was, to some extent, dictated by its use in that experiment. Emotional arousal--defined as physiological activation--was also chosen as the criterion variable because it is a significant and powerful phenomenon

in human experience. Spielberger (1966) views maladaptive emotional arousal (anxiety) as the major causative factor in a wide variety of handicapping psychological and psychosomatic symptoms. From theoretical positions as divergent as psychoanalysis and behavior therapy, Freud (1935) and Wolpe (1958) have converged to support the common assumption that anxiety is the basis of psychopathology.

Whether this most pervasive of human problems is dealt with as a cause or as an effect, the objective of therapeutic treatment is the reduction of debilitating emotional arousal. Accordingly, psychophysiological Peter Lang (1971) states that, "It is quite appropriate that psychophysiological methods should be employed in the study of (psychological) treatment" (p. 76).

Unfortunately, physiological responses are not uniform indicators of emotional arousal. There can be a great deal of variation across response channels within an individual and among individuals. However, the fact that variation exists does not preclude characteristic response modes in individuals (Bindra, 1970, pp. 3-20). Bindra notes that the pattern of autonomic reactions remains fairly stable for an individual regardless of the stimulus (p. 10). Thus, investigations of physiological responsivity would appear to be reliable.

Of primary interest to the present investigation is (a) whether physiological variables can be taken as indices for emotional arousal and (b) whether cognitions mediate autonomic responses. One answer to the first question can be found in the anecdotal remarks of the psychophysicologists themselves. Lacey and Lacey (1970, pp. 205-227), for example, in speaking of physiological arousal, state that any



investigator, regardless of theoretical bent, makes "the implicit assumption that these autonomic responses can be viewed as meter readings or indices of a complex called emotion" (p. 205).

Any meaningful conclusions, however, can be drawn only from the results of the empirical investigations, not from the off-the-cuff remarks of the investigators. There is evidence to suggest that physiological reactivity is related to emotion in ways other than definitional.

Several researchers have found that physiological arousal correlates well with subjective emotional experiences (e.g., Dykman, Reese, Galbrecht, & Thomasson, 1959; Lader, 1967). Dykman et al., for example, found that individuals who are generally apprehensive, as measured by the Taylor Manifest Anxiety Scale, tend to operate at higher levels of autonomic arousal (GSR, heart and respiration rates) than do normals. Other evidence comes from such clinicians as Paul (1966), who used systematic desensitization to reduce emotional arousal as defined behaviorally and by self-report and physiological measures. The literature on GSR as a measure of emotion is particularly extensive. Many researchers (e.g., Wilson, 1967; Shapiro & Schwartz, 1970) conclude that there is a significant correlation between palmar skin activity and affective experience. Physiological arousal appears to be generally accepted as a valid indicant of emotion in psychophysiological research.

A basic assumption of CBM is that cognitions mediate emotions. Several psychophysiological studies which have particular relevance to RET were previously cited as evidence for that assumption. The research

on Schacter and Singer's (1962) theory of emotion also seems relevant here. Additionally, a variety of both laboratory and clinically relevant studies support the assumption and are presented below.

Research shows that the GSR can be conditioned to verbal stimuli and, further, that GSRs occur to semantically similar generalization words. Brotsky (1968), for example, used a classical conditioning procedure to condition GSRs to verbal stimuli. The unconditioned stimulus was loud, white noise, while the conditioned stimulus was a "concept instance," e.g., the word "ball." During a test phase other concept instances, e.g., "balloon," as well as concept names e.g., "round," were presented. The predicted semantic conditioning and generalization were obtained. Lang, Geer, and Hnatiow (1963) obtained semantic conditioning (the UCS was occasional electric shock) and semantic generalization to GSRs. Further, they found that heart rate differentiated between hostile and neutral words. In an earlier study with similar results, Cohen, Silverman, and Burch (1956) obtained significantly larger GSRs to emotive words (e.g., sex).

Respiration, as well as GSR and heart rate, has been used as an indicator of anxiety. Heim and his associates (Heim, Knapp, Vaccaro, Globus, & Nemetz, 1968) found that breathing volume covaried systematically with the content (i.e., degree of emotional significance) of the subject matter being discussed.

More complex cognitive patterns than simple verbalizations also received empirical attention. Psychophysiological studies of systematic desensitization and a variety of associated physiological assumptions have been undertaken. Van Egeren (1971; Van Egeren,



Feather, & Hein, 1971) obtained support for several such assumptions. Relevant to this survey is that the independent variable used in the study was mental images of subjects.

In an ingenious piece of research which studied the effects of cognitions on conditioned emotional responses, Proctor and Malloy (1971) demonstrated that abstract concepts can acquire emotion-arousing properties. Subjects were taught to sort stimuli using a biconditional--both or neither--rule. A stimulus was considered a positive instance of the biconditional rule if both or neither of two conditions were present (for example, if a stimulus was both square and red or neither square nor red). After learning the rule, subjects were administered an electric shock following each positive instance of the rule. Anticipatory GSR responses to the rule were subsequently obtained. (This was true even when the subject was exposed to novel stimuli.)

A similar study in which cognitions mediate autonomic activity has been reported by Grings (1973, pp. 233-262). One of five loud noises varying in intensity was randomly presented to each subject over a series of trials while physiological responses were monitored. Prior to each presentation, the experimenter would tell the subject what level of noise intensity was to occur. During a test phase, subjects were informed that they were about to hear an intermediate noise, while in reality they were presented with either a high- or low-intensity noise. In accordance with a cognitive mediational hypothesis, "A loud noise signaled to be softer was reacted to less, whereas a



soft noise signaled to be louder was reacted to as if it were louder" (Grings, 1973, p. 256).

Finally, Razran (1961) cites the Russian psychologist Lisina, who reports that subjects watching their own plethysmograph records transformed (probably via self-instruction) digital vasoconstriction into vasodilation in order to avoid shock. Parenthetically, note that this was eight years prior to Neal Miller's (1969) classic article on the operant conditioning of the autonomic nervous system.

Only a small sample of the psychophysiological literature has been reviewed in this section, but it should be clear that physiological activity can be a valid indicant of emotional arousal and that cognitions mediate, at least to some extent, physiological responsivity.

Evidence having specific relevance for the validity of the particular measures used in this study will be presented in Chapter II when those measures are introduced. Also, a self-report measure of anxiety used during a portion of the experiment will be explained in the next chapter.



CHAPTER II

METHOD

Overview

The present experiment can most easily be viewed as involving two phases. Phase I is concerned with the classical conditioning model of rational emotive therapy (RET) posited by Russell and Brandsma (1974). This model of RET has already been discussed in some detail in the previous chapter. Several predictions generated by the model will be tested, and, inasmuch as Russell and Brandsma have already tested these predictions, Phase I serves as a replication of their experiment.

Phase II is calculated to answer questions of a different kind, the first being, how do analogs of three language conditioning techniques differ in effectiveness in reducing emotional arousal? An additional and somewhat related question to which an answer is sought in Phase II is: Under what conditions do people learn to respond anxiously to certain self-verbalizations?

Because Phase I and Phase II attempt to answer different, though related, research questions, the experimental manipulations within each phase differ to some extent. In addition, the design and analysis features of each are distinct. In the interests of clarity, the procedures and the design and analysis for each phase will be discussed separately.



There are, however, many similarities between the two phases. The same subjects are used in both phases; the dependent variables, with one exception, are identical, as are several of the experimental manipulations. Consequently, to avoid repetition in discussing the two phases, a description of the subjects, the dependent variables, and the several identical experimental manipulations will precede the procedures section. Then, the differences between the two phases will be made clear as the experimental procedure of each phase is detailed. At that point a formal statement of the hypotheses will be presented. Finally, a description of the design and analysis will complete the chapter.

Subjects

Fifty female undergraduates, living in residence halls on the Michigan State University campus during spring term, 1975, participated in the experiment. Females were used exclusively as subjects for three reasons. First, the Russell and Brandsma (1974) study, which the present experiment replicates, used only females. Second, the experimental manipulations of two independent variables--relevancy (manipulated by the Coed Problem Checklist) and sentence type (manipulated by the sentence dyads developed for each checklist item)--were keyed to females. An attempt to include males would have been extremely time consuming, as it would have required the development of a male problem checklist and corresponding sentence dyads. Finally, since the inclusion of both sexes increases the error variance in the physiological dependent variables (see, for example, Venables & Christie's 1974,



pp. 49-55, discussion of differential responsivity of the sexes in electrodermal research), only one sex was included in the present study.

The subjects were solicited through an advertisement placed in the weekly news bulletins of two residence halls (Appendix A). Inasmuch as each residence hall was organized into 10 social units, or "houses," with approximately 50 women in each house, the advertisement was directed toward house officers. Participation in the experiment was presented as a fund-raising project. Representatives of two houses, one from each residence hall, responded. One house contributed 26 subjects and the other 30; both houses were paid \$2.00 per subject. Because the physiological records of six subjects were unscorable, they are not included in the data analysis.

Table 2.1 provides a summary of several demographic characteristics of the 50 subjects participating in the study. The reader can thus determine the extent to which the present results can be generalized to other populations.

Dependent Variables

Emotional arousal, the criterion variable, was defined in terms of physiological responsivity to experimental stimuli. The validity of operationalizing emotional arousal in this way was discussed in the previous chapter. Three physiological channels--sweat gland, cardiovascular, and respiratory activity--were monitored by means of a Grass Model 5D polygraph. The physiological recordings were scored so as to yield eight dependent variables. A discussion of the measurement and scoring of these eight variables follows.

Table 2.1
Demographic Characteristics of Subjects

Characteristic	Component Breakdown by Frequency and Percentage		
Sex	Male 0 (0.0%)	Female 50 (100.0%)	
Class	Freshman 32 (64.0%)	Sophomore 16 (32.0%)	Junior 2 (4.0%)
Age	18 16 (32.0%)	19 23 (46.0%)	20 11 (22.0%)
Race	Caucasian 47 (94.0%)	Afro American 3 (6.0%)	

Skin Conductance Variables

Lang (1971, pp. 75-125) concludes his review of psychophysiological research by noting that palmar sweat gland activity is probably the most reliable physiological indicator of emotional arousal. Of the several measures of sweat gland activity (e.g., skin resistance, skin potential), skin conductance, simplistically described as an electrical property of the skin, has been recommended by many authors as being the most direct measure. The parallel relationship between skin conductance (SC) and sweat gland activity has been demonstrated by Thomas and Korr (1957). Commenting on the Thomas and Korr research, Montagu and Coles (1966) assert that for all practical purposes SC can be regarded as directly proportional to the number of active sweat glands. Thus, SC changes are more consistently related to sweat production than are other measures. Further, Lang (1971, pp. 84-85) notes that SC tends to be more normally distributed. Another advantage of SC is that obtained



scores do not require conversion (skin resistance measures, for example, are often converted to SC before they are analyzed).

In the present study, skin conductance was measured by means of two silver silver-chloride disc electrodes (constructed in accordance with instructions found in an article by Venables & Martin, 1967) attached to the palm of the subject's right hand. One electrode was attached about an inch below the base of the thumb, while the other was attached on the opposite side of the hand about 2 inches below the base of the little finger. This particular placement is bipolar; that is, both electrode sites show electrodermal activity. (See Venables & Christie, 1973, p. 81, for a discussion of the advantages of bipolar over unipolar--one active and one inactive site--placement of electrodes.)

The electrodes were connected to a conductance coupler, the circuitry for which has been described by Lykken and Venables (1971). The purpose of the conductance coupler was to convert the constant-current circuitry of the Grass 5P1 pre-amplifier to the constant-voltage method necessary for direct SC measurement. As a result of this conversion, a subject's skin conductance was registered by the polygraph on the recording chart paper in micromhos. Scoring a subject's skin conductance record yielded three scores: skin conductance response, skin conductance response frequency, and skin conductance response total.

Skin conductance response. The amplitude of the first response after a stimulus was presented constituted the skin conductance response (SCR). Conductance was measured as the difference in micromhos between



the start of the response and the maximum deflection of the recording pen. A response was defined by two criteria: (a) At least a .1 micromho change was required, and (b) the pen deflection had to be sustained for at least one-half second. A response was considered completed when the recording pen leveled off for a minimum of one-half second.

Venables and Christie (1973, p. 92) note that since skin conductance varies with electrode area, all measurements should be reported as micromhos per square centimeter. A conversion to this standard unit allows for comparison of SCRs among studies using it as a dependent variable. In the present experiment, each electrode area was .78 square centimeters. Since a bipolar placement was used, the effective electrode area is half that under a single electrode. Taking these factors into account, each SCR was divided by .39 (half of .78), yielding micromhos per square centimeters.

Skin conductance response frequency. Using the response criteria noted above, the number of responses occurring between the onset of one stimulus and the onset of the next stimulus were counted and recorded. Thus, skin conductance frequency (SCF) is a measure of all palmar sweat gland reactions to the stimulus.

Skin conductance response total. Total skin conductance (SCT) was recorded as the sum of the amplitudes of all responses occurring between the onset of one stimulus and the onset of the next stimulus. Consequently, SCT is a measure of the total palmar sweat gland sensitivity to a given stimulus. As with the skin conductance response, SCTs are reported as micromhos per square centimeter.



Cardiovascular Variables

The brief review of the psychophysiological literature in Chapter I suggests that the functioning of the cardiovascular system is strongly influenced by mental activity. Two cardiovascular phenomena viewed as being most sensitive to thought processes (Weinman, 1967, pp. 187-207) are (a) digital pulse amplitude (DPA), a measure of pulsatile changes in the peripheral vascular vessels; and (b) digital blood volume (DBV), a measure reflecting the quantity of blood present in the peripheral vascular vessels. Vasoconstriction is a process which is defined as a lessening of DPA and a reduction in mean DBV (Brown, 1972, pp. 159-195). Burch (1948) and Sternbach (1966, p. 69) both suggest that cardiovascular activation due to unpleasant thoughts or "anxiety" will appear as vasoconstriction of the peripheral blood vessels. Thus, monitoring changes in DPA and DBV should yield indirect evidence of emotional arousal. Likewise, an increase in heart rate (HR) has been used as an indicant of emotional arousal (e.g., Lacey, Smith & Green, 1955; Graham & Clifton, 1966).

Typically, the measurement of changes in the peripheral vascular vessels is by means of a device known as a plethysmograph. In the present study, a Reflectance Photoelectric Plethysmograph (Grass model RPT1) was used to monitor cardiovascular activity. The plethysmograph, whose surface area is about the size of a dime, was placed on the volar surface of the subject's left thumb; it was secured snugly to the thumb with adhesive tape 2 inches wide to prevent extraneous light from penetrating to the plethysmograph. The plethysmograph was attached directly to the Grass 5P1 Preamplifier, and cardiovascular



activity was recorded as pen deflection on the chart paper. The resulting record was scored to yield three measures: digital pulse amplitude (DPA), digital blood volume (DBV), and heart rate (HR).

Digital pulse amplitude. Digital pulse amplitude is always a relative measure which in the present study is expressed as the percentage change between the pre-stimulus and during-stimulus values. In practical terms, DPA was defined as the difference between the diastolic (trough) and systolic (peak) levels of each pulse. This difference between the diastolic and systolic levels of the full pulse immediately preceding the stimulus was compared to the average of the differences between the diastolic and systolic levels of the first 13 beats after the stimulus was presented; difference scores were recorded in millimeters. Thirteen beats were used because it took approximately that many beats to encompass the entire vasoconstriction response to each stimulus. The formula for obtaining DPA was:

$$DPA = \frac{\frac{x-y}{(x_p-y_p)}}{n} (100) \quad \text{Note: scores} > 100 = \text{increase}$$

$$\text{scores} < 100 = \text{decrease}$$

where x = prestimulus trough
 y = prestimulus peak
 x_p = poststimulus trough
 y_p = poststimulus peak
 n = 13

Digital blood volume. Likewise, digital blood volume (DBV) is a relative measure, and again the beat immediately preceding the onset of the stimulus was compared to the 13 beats following the onset of that stimulus. Blood volume, however, was defined as the diastolic--lowest--



level of each heart beat. DBV was reported as millimeters measured from an arbitrarily selected 0 point (see Figure 2.1). The formula for obtaining DBV was

$$DBV = \frac{x_1}{x_p/n} \quad (100)$$

where x_1 = prestimulus trough

x_p = poststimulus trough

n = 13

Heart rate. In the present study, heart rate (HR) was reported as the change in beats per minute from the prestimulus beat to the average of the first 12 beats after the onset of the stimulus. These values were obtained by measuring the distance in millimeters between the two peaks immediately preceding the stimulus and the average distance per beat of the following 13 peaks after the stimulus was presented. Each of these values was divided into 600 millimeters (the paper chart speed per minute), yielding beats per minute. Finally, the prestimulus value was subtracted from the poststimulus value, resulting in changes in HR per minute. Thus, positive values indicated an acceleration in HR, while negative values meant deceleration. The formula for obtaining HR was:

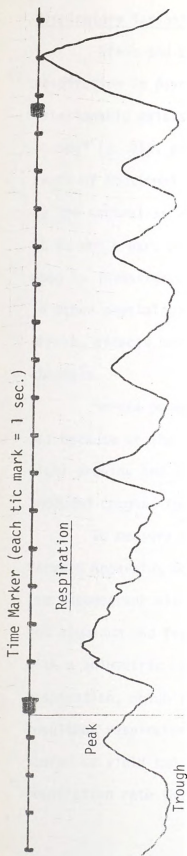
$$HR = \frac{600}{x_{2/2} - x_1} \quad (100)$$

where x_1 = prestimulus distance between peaks

x_2 = poststimulus distance between peaks

n = 12





Skin Conductance

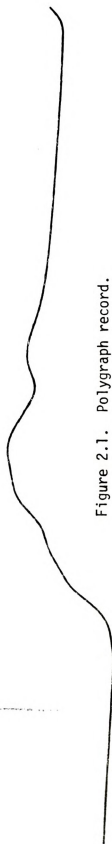


Figure 2.1. Polygraph record.



Respiratory Variables

Stein and Luparello (1967, pp. 75-94) conclude their review of respiration in psychophysiological research by stating that "a close relationship exists between the respiratory system and emotional processes" (p. 91), and they view measures of respiration as valid indicators of emotional arousal. However, because respiration is regulated by the central as well as the autonomic nervous system, it is clear that it is not a pure measure of emotional arousal. Often respiration is used by investigators as a monitoring channel to help detect artifacts in other physiological channels. For example, a cough, or even a deep breath, affects both the skin conductance and cardiovascular response channels.

In the present study, respiration was used for two reasons: (a) because of the information regarding emotional arousal that it might provide and (b) to serve a monitoring function (trials which included coughs, for example, were run again).

To measure respiratory activity, a pneumograph (Model # 605, Harvard Apparatus Company) was fastened around the subjects' rib cage. The pneumograph was constructed with a molded corrugated neoprene tube and aluminum end fittings. A small hose connected the corrugated tube with a Volumetric Low Pressure Transducer (Grass Model # PT5A) for respiration, which in turn was attached to the 5P1 Preamplifier. The resultant respiratory activity as recorded on the chart paper was scored to yield two respiration measures: respiration depth (RD) and respiration rate (RR).



Respiration depth. This measure was calculated in a manner similar to digital pulse amplitude. The trough of the breath immediately before the onset of the stimulus was subtracted from its next peak. Likewise, the first three troughs following the stimulus onset were subtracted from their respective peaks and averaged. Finally, the pre-stimulus breath was divided into the average of the poststimulus breaths and multiplied by 100. The result was a percentage change score. The formula was:

$$RD = \frac{x_2 - y_2/n}{x_1 - y_1} (100)$$

where x_1 = prestimulus trough
 y_1 = prestimulus peak
 x_2 = poststimulus trough
 y_2 = poststimulus peak
 n = 3

Respiration rate. Respiration rate (RR) was scored in a similar fashion to heart rate. Two poststimulus breaths (first to third peaks) were converted into breaths per minute and subtracted from the prestimulus breath (peak to peak), after it had also been converted to breaths per minute. Again, positive numbers indicated acceleration of breathing rate, while negative numbers meant deceleration. The formula for obtaining RR was:

$$RR = \frac{600}{x_2/n - x_1}$$

where x_1 = prestimulus distance between peaks
 x_2 = poststimulus distance between peaks
 n = 2



Experimental Manipulations

Two independent variables, problem relevancy and sentence type, were common to both phases of the experiment. One nuisance variable--ordering of sentence dyads--was included in the design of each phase and will be discussed in this section. Likewise, the follow-up questionnaire, which was completed by all subjects regardless of experience, will be described.

Problem Relevancy

Central to Ellis' hypotheses about emotional upset is the notion that thoughts precede and accompany the emotional disturbance. These thoughts, or "self-talk," are irrational as well as pejorative, and they are typically elicited by certain environmental events (to include internal environmental events). Which events elicit what thoughts, and for which people, is largely a function of the conditioning history of each person. Thus, some people become emotionally upset when they are socially snubbed, while others are inordinately bothered by a low grade on an exam. In sum, some events have emotional relevance for some people but not for others.

In order to insure that subjects would be able to identify situations or events that were truly relevant to them, Russell and Brandsma developed the 100-item Coed Problem Checklist. Items on the checklist reflect problems frequently encountered by college women in three main areas: personal, academic, and family-parental. The checklist was empirically derived from a sample of college women and was felt to include a sufficient number of items to insure that a subject could

select from among them two personally relevant and significant concerns, as well as two non-relevant concerns. Responses to high-relevant and low-relevant concerns could thus be compared.

The Coed Problem Checklist as it appears in Appendix B includes several changes from the original. First, one or two key words in each item were underlined. These underlined words served as a part of the Phase II treatment regimen for some subjects (described in detail in the Procedures section of this chapter). Second, the instructions were altered to explain the key word portion of each item and to direct the subjects to select one of the key words as representative of their designated high- and low-relevant items. Third, the instructions also incorporated a brief descriptive key for each of the seven numbers used to identify the degree of relevancy of an item. Fourth, the wording of some items was altered to make the item less ambiguous, e.g., "I feel so discouraged I may quit school" was changed to "I feel so discouraged about my grades I may quit college." Fifth, the wording of some items was also changed to include more representative key words, e.g., "My parents do not like who I am dating" was changed to "My parents do not like my present boyfriend." Finally, two items dealing with problems associated with living off-campus were deleted.

The question of the validity of this instrument as a tool for manipulating the relevancy dimension is an important one. If items on the checklist do not include highly relevant concerns of subjects, then the dependent variables would not be expected to differentiate between "high"- and "low"-relevant items. To ascertain the validity of the checklist, several pertinent questions were included in the Follow-up

Questionnaire (Appendix C). Subjects were asked: (a) Did the checklist contain your most relevant concern? (b) If not, where do you rank your highest ranked checklist item relative to your most relevant concern? 1st? 2nd? 3rd? 4th? 5th? other? (c) Is there any problem, either on or off the checklist, to which you would assign a 7 (a very significant problem which causes much concern and worry), a 6 (significant problem--frequently experience concern about it), a 5 (somewhat significant problem--think about it fairly often)?

The results of these questions are presented in Table 2.2. It is clear that the Coed Problem Checklist included a large majority of the subjects' most relevant concerns and at least the fourth most relevant for all subjects. Therefore, it can be considered a valid instrument which served its function as a basis for manipulating the relevancy variable.

At the end of the experiment, each subject was asked to re-rank, i.e., to indicate the degree of relevancy, of 14 items on the checklist. The re-ranking of the two high- and two low-relevant items were of most importance and were intended to give some indication as to the change in subjective discomfort of each subject. The other 10 items were randomly selected and were included only to help each person rank the high- and low-relevant concerns in the context of a variety of items without having to retake the entire checklist.

Sentence Type

For each item of the checklist, a pair of sentences was developed (Appendix D) corresponding to the A and B portions of Ellis' ABC model.



Table 2.2

Validation of Coed Problem Checklist

Coed Problem Checklist Included:	Maximum Degree of Subject's Concern About Any Problem				Total
	7	6	5	4	
Most important concern	19	10	4	1	34 (68%)
Second most important concern	8	2		1	11 (22%)
Third most important concern	3	1			4 (8%)
Fourth most important concern		1			1 (2%)
Fifth most important concern					
Total	30 (60%)	14 (28%)	4 (8%)	2 (4%)	50 (100%)

The A sentence was constructed to state the concern as factually and objectively as possible (e.g., "Compared to other girls who are my age and height, I am several pounds overweight"), while the B sentence contained a negative, emotion-laden and irrationally drawn conclusion about sentence A (e.g., "I'm too fat . . . no one likes obese, ugly people like me . . . I just hate myself"). Note that in this study the C portion of Ellis' paradigm involved the subjects' emotional arousal recorded by the polygraph.

These two types of sentences served as the experimental stimuli. Physiological responses to which were scored and analyzed as the dependent measures. When combined with the relevancy dimension, sentence



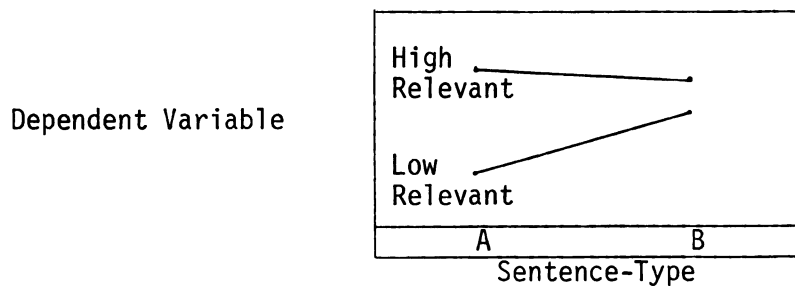
type could involve one of four possibilities, as visually displayed in Table 2.3. Based on the Russell and Brandsma model of RET, specific predictions concerning emotional arousal to each type can be made. These predictions are delineated in the hypothesis section of this chapter.

Table 2.3
Relevancy and Sentence-Type Combinations and Predictions

A. Combinations

		Sentence-Type	
		A	B
Relevancy	High Relevant		
	Low Relevant		

B. Russell and Brandsma's Predictions*



*Note the interaction effect.

As with the Coed Problem Checklist items, some of the sentences in the sentence dyads were changed (a) to include key--underlined--words appearing in items on the checklist (e.g., "I have dated several different boys since I have been in college, and I would not like to marry any of them" was changed to "Of the boys that I have known so far, I would not choose any as my husband") and (b) for clarity (e.g., "I do not have any social life on campus" was changed to "I have almost no social life on campus").

In addition to the experimental sentence dyads, six neutral sentence dyads (Appendix L), also developed by Russell and Brandsma, were used in the study; they consisted of logical syllogisms of an impersonal nature. For example:

- A. Every sixteen year old who passes the required tests and exhibits sufficient capabilities is issued a driver's license.
- B. Edgar passed the required tests and impressed the examiner with his capabilities, therefore he was issued a driver's license.

Neutral sentences were used for all subjects as a means of acquainting them with the experimental procedure--reading sentences aloud--and providing an opportunity for physiological habituation to take place before high- and low-relevant sentence dyads were presented. The neutral sentence dyads were also presented to a control group in Phase I.

In developing all of the sentence dyads, Russell and Brandsma attempted to control for length of sentence within each dyad.

Order

It is conceivable that if high-relevant sentence dyads are presented first to all subjects, then differences in responsivity to high- and low-relevant sentence dyads might simply be due to an ordering

effect. To control for this possibility, the order of presenting high- and low-relevant sentence dyads was counterbalanced among subjects. One-half of the subjects in each phase were presented high-relevant dyads first, while the other half were presented sentence dyads having low relevancy first. Thus, this nuisance variable was randomly distributed among subjects, minimizing its effect on the outcome of the study.

Parenthetically, it should be noted that regardless of the relevancy of a particular sentence dyad, A sentences always preceded B sentences.

Follow-up Questionnaire

The follow-up questionnaire administered to each subject at the end of the experiment is included as Appendix C. The purpose of the questionnaire was four-fold: (a) to ascertain the utility of the Coed Problem Checklist as an instrument for manipulating the relevancy variable; (b) to determine the extent to which participants in the study were aware of emotion-producing "self-talk"; (c) to investigate the possibility of experimental demand characteristics--the subjects' expectancy--serving as an explanation for the obtained results; and (d) to evaluate the degree to which subjects in the various Phase II treatment groups would feel comfortable seeking the services of a counselor whose approach was represented in the various therapy analogs. An additional purpose of the questionnaire was to solicit general feedback about the study from the participants.

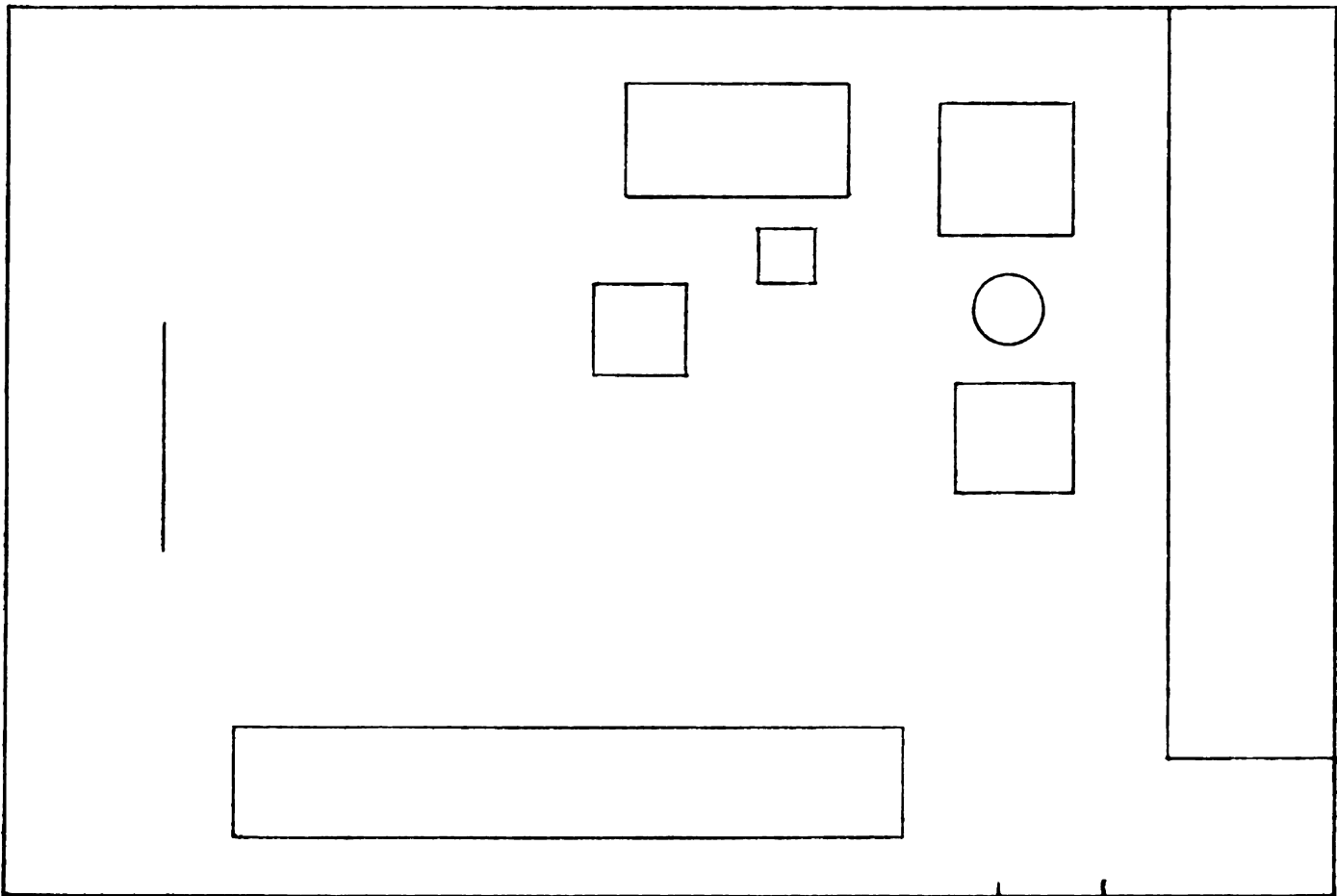
Procedures

Phase I

Subjects were assigned at random to an experimental condition (n=34) and to a control condition (n=16). The subjects, who had signed up for one and one-half hour time blocks, arrived one at a time at the experimental room. Located in an empty Giltner Hall physiology laboratory, the experimental room was partitioned off from the larger laboratory in order to screen extraneous and potentially distracting visual stimuli. The layout of the experimental room is shown in Figure 2.2.

Upon arrival, each subject was given a brief and very general overview of her upcoming experimental experience. She was told that she would be asked to fill out some forms, that she would then be hooked up to the polygraph, and that recorded instructions would tell her about the stimuli which were to be projected onto a screen in front of her. Also, she was told that the physiological attachments would be removed after about 45 minutes, and she would be asked to complete some additional forms. Finally, each subject was informed that at the end of the experiment, the experimenter would review her polygraph record with her and answer any questions she might have about the experiment.

Following the overview, the subject was left alone to complete the Subject Consent Form (Appendix F) and the Coed Problem Checklist (Appendix B). When the subject had completed the forms, the experimenter briefly reviewed the Coed Problem Checklist with her. Specifically, the experimenter checked to see that the two high- and two low-relevant concerns had been recorded correctly in Part II of the checklist. Also, the experimenter made certain that no more than one



- a = Table for completing consent form, Coed Problem Checklist and Follow-up Questionnaire
- b = Slide projector screen
- c = Subject's chair
- d = Supply table for physiological apparatus
- e = Table for conductance coupler and pneumograph transducer
- f = Grass Model 5D polygraph
- g = Experimenter's stool
- h = Table for slide projector and tape recorder
- i = Counter for slides and forms

Figure 2.2. Layout of experimental room.

key word or phrase was listed as representing any of the four sentences in Part II.

Next, the subject was instructed to take a seat in a cushioned office arm chair, which faced a 4- by 4-foot slide projector screen approximately 8 feet away. While seated in the chair, the subject was attached to the polygraph. First, the pneumograph was fastened around the subject's ribcage; then, after the target palmar skin areas of the right hand had been cleaned with rubbing alcohol, the skin conductance electrodes were attached to the palm by means of commercially manufactured adhesive collars. The interface between the silver plate of the electrodes and the skin was filled with an electrolyte medium composed of one part normal saline and two parts Unibase (Parke-Davis). In addition, a small cup-electrode filled with Hewlett Packard Redux electrode paste was placed on the volar surface of the subject's right wrist and secured with a strip of adhesive tape. This electrode served as a ground for the subject. Finally, the plethysmograph was placed on the volar surface of the distal phalanx of the subject's left thumb and secured with a 2-inch-wide strip of adhesive tape.

When the subject was attached to the polygraph, she was instructed to sit comfortably, relax, and to keep movement to a minimum. She was also told that it would take approximately 10 minutes for the experimenter to prepare for the experiment. During this preparatory period, the experimenter selected the correct stimuli for that subject and adjusted the balancing resistors of the conductance coupler to assure an appropriate skin conductance baseline level.



All subjects were instructed to read aloud four sentence dyads (eight sentences shown successively) as they were exposed by means of a Rotomatic Sawyer slide projector. The first two dyads, which were not scored, consisted of the neutral syllogisms described earlier in this chapter (see Appendix D) and were presented merely to allow subjects an opportunity to adjust to the procedure, as well as to provide the experimenter time to readjust the balancing resistors. For the 16 neutral group subjects, the third and fourth dyads were also of neutral and impersonal content. However, for the 34 experimental subjects, the third and fourth sentence dyads involved the A and B sentences (Appendix C) of their most relevant and least relevant concerns, as previously identified on the Coed Problem Checklist. Each stimulus sentence was exposed for 15 seconds, and there was a 15-second inter-trial interval between sentences. One-half of the experimental subjects were presented their high-relevant sentence dyads first, while the other half were presented their low-relevant dyads first. The experimental procedure for both Phase I and II is graphically displayed in Table 2.4.

Just prior to the presentation of the first stimulus sentence, the following taped instructions were given:

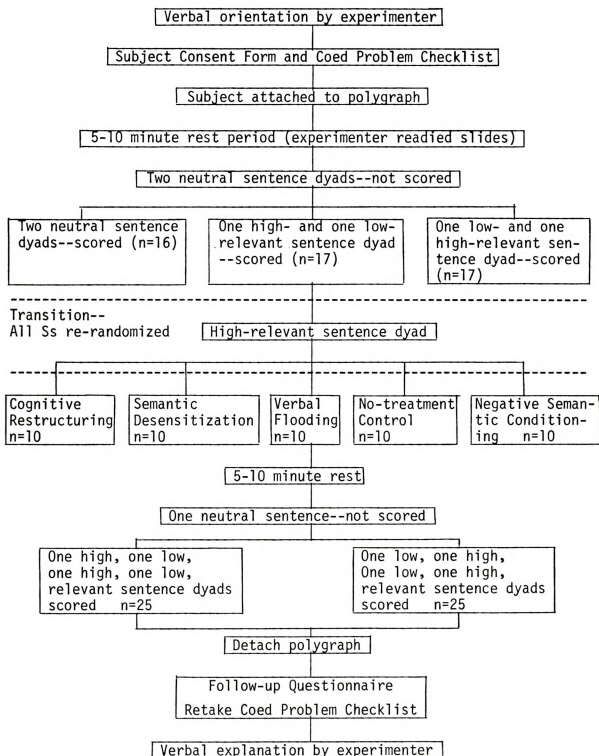
The experimenter is going to show you several pairs of sentences. The sentences will be projected onto the screen in front of you one sentence at a time. Each sentence pair will pertain to the same general area. Please read each sentence aloud, concentrate on it, and try to imagine that these sentences are your own thoughts, and you are just saying them aloud to yourself.

As part of the transition from Phase I to Phase II, each subject, regardless of condition, was presented the sentence dyad related to her most highly relevant concern. This sentence dyad, which was not scored,



Table 2.4

Diagram of Experimental Procedures





was presented in the same manner as described above, 15 seconds after the preceding sentence dyad flashed off the screen.

Phase II

Subjects were randomly assigned to one of five groups (n=10). The assignment of subjects to groups was on a stratified basis, insuring that pre-Phase II experiences were equally distributed among the five groups. (Note that during exposure to treatment, physiological responses were not monitored.) The treatment of three of the groups was directed at reducing a subject's emotional arousal to the A sentence of her most highly relevant concern. This treatment goal, i.e., to reduce emotional arousal to the stimulus event which typically elicits it, is consonant with RET and certain language conditioning techniques. These three treatments were (a) cognitive restructuring, (b) semantic desensitization, and (c) verbal flooding.

Cognitive restructuring. The cognitive restructuring (CR) treatment consisted of listening to a tape recording (see Appendix G for transcripts) presenting rational-emotive principles. One of four tapes, each approximately 12 minutes long, was activated after the subject had read aloud the transitional sentence dyad discussed above. Each tape began by noting that the subject had reacted physiologically to that transitional sentence dyad, specifically to sentence A--a factual statement about her most relevant concern. A reason for this reaction was offered: namely, that, although she may or may not have been aware of it, she likely had said something to herself similar to the B statement, i.e., drawn emotive and negative conclusions about



sentence A. Basically, the ABCs of rational-emotive therapy were presented, both verbally on the tape recording and by means of a tape supplement handout (Appendix H). Alternative B statements were suggested, and an opportunity to generate and practice alternative statements was provided.

The four different tapes used in the CR treatment were the result of an attempt to tailor the treatment to individual concerns. Specifically, each item in the Coed Problem Checklist was classified in terms of one of Ellis' (1962) 11 irrational ideas. All of the items seemed to cluster around four of these ideas: (a) love and approval, (b) perfectionism, (c) blaming, and (d) catastrophizing (see Appendix I for categorization). Thus, a tape was developed to deal specifically with each of these four areas of concern. The introductions and conclusions of each tape were identical, while the body of each was tailored to the irrational idea to which the highly relevant concern conformed.

It should be noted that all taped instructions and treatments were recorded by the same individual--an active therapist in a local community mental health agency who uses rational emotive therapy almost exclusively in his practice. He helped to categorize the items in the Coed Problem Checklist according to irrational ideas, and he participated in developing the four transcripts for the CR group.

Semantic desensitization. Fifteen seconds after the screening of the transitional sentence dyad, the following taped instructions were activated:

The tape recorder has been activated because of your physiological response to the last pair of sentences that you read. Thus, for the next few minutes, you will be involved in an attempt to induce

emotional transfer by loud verbalizations. This portion of the experiment is based upon the ideas and practices of a nationally known psychologist. Please listen carefully to the instructions. You will be asked for your impressions at the end of the experiment.

The experimenter will now present pairs of words together. The first word will be presented visually on the screen in front of you. The second word will be presented orally by the experimenter. Each time, I would like you to pronounce the second word aloud, after the experimenter has pronounced it. Try to pair these two words together in your mind. That is, keep your eyes on the screen in front of you. Concentrate on the word when it is flashed on the screen. Then pronounce out loud the word you hear the experimenter pronounce. Remember, it is important to concentrate on these two words together. These instructions will not be repeated during this part of the experiment. If you have any questions, please ask the experimenter now.

The stimulus word flashed on the screen was the same word the subject had indicated on the Coed Problem Checklist as being representative of her highly relevant concern. Recall that when completing the Coed Problem Checklist (Appendix B) the subject was asked to select an underlined word or phrase as representative of her concern. The list of 18 positive words pronounced by the experimenter and repeated by the subject was taken from the Staats and Staats (1957) list of words to condition meaning (Appendix J). The experimenter pronounced, and the subject repeated, the positive evaluative word, while the stimulus word was exposed on the screen. Each of the 18 positive evaluative words was paired with the stimulus word six times, making a total of 108 pairings. Each trial--presentation of both stimulus word and positive evaluative word--lasted 5 seconds, with 2-second inter-trial intervals. This procedure very closely approximates Hekmat's (1972) method of counterconditioning meaning.

Verbal flooding. The procedure for subjects in the verbal flooding (VF) group was identical to the semantic desensitization (SMD)



procedure with one exception. In place of positive evaluative words, the 18 neutral words (Staats & Staats, 1957) shown in Appendix K were used. Since the neutral words were not intended to serve either a conditioning or counter-conditioning function, VF can be viewed as extinction; that is, the repetitious presentation of a significant word--significant in that it represents a highly relevant concern--was intended to reduce emotional arousal to the highly relevant concern.

These three groups--cognitive restructuring, semantic desensitization, and verbal flooding--were compared to each other and to a no-treatment control group.

No-treatment control. Fifteen seconds after the screening of the transitional sentence dyad, the following taped instructions were activated:

Please relax for a few minutes while the experimenter prepares the next portion of the experiment. This preparation period will last about 15 minutes. The tape will be activated at that time to instruct you concerning the next segment of the experiment.

Negative semantic conditioning. Also compared to the no-treatment control group was the negative semantic conditioning (NSC) group. The procedure for this group was identical to the SMD and VF groups, with two exceptions. The stimulus word was the word(s) a subject selected as representing her least relevant concern, while the words paired with it--those verbally pronounced by both experimenter and subject--were negative words. The 18 negative evaluative words used with this group were also taken from the Staats and Staats (1957) list and can be seen in Appendix L.

This procedure attempted to condition negative meaning, and thus emotional arousal, to a concern of no importance to subjects. The



theoretical import of this portion of the study has been discussed in Chapter I.

Upon completion of the differential treatment procedures, all subjects were asked to relax and sit comfortably for about 10 minutes. During this 10-minute period, the appropriate experimental stimuli were readied, and the balancing resistors of the conductance coupler were adjusted. Then, the following instructions were given via the tape recorder:

Once again, the experimenter is going to show you several pairs of sentences. Again, the pairs of sentences will be projected onto the screen in front of you, one sentence at a time. Each sentence pair will pertain to the same general area. Please read each sentence aloud, concentrate on it, and try to imagine that these sentences are your own thoughts and you are just saying them aloud to yourself.

As seen in Table 2.4, all subjects read one neutral sentence dyad--not scored--and four (two high- and two low-relevant) personal and emotive sentence dyads. These four sentence dyads were presented in one of two orders: (a) high, low, high, low or (b) low, high, low, high.

Following these posttreatment measures, the physiological attachments were removed from the subject, and she was asked (a) to re-take part of the Coed Problem Checklist--10 randomly selected items in addition to the two high-relevant and two low-relevant items--and (b) to complete the Follow-up Questionnaire (Appendix E). When these paper and pencil tasks had been completed, the experimenter showed each subject her physiological record and explained the study to her. Five to 20 minutes were spent with each subject, answering questions and discussing her role in the experiment. Several subjects were given the



Tape Supplement Handout (Appendix H), and, to those who expressed an interest in rational-emotive principles, A Guide to Rational Living (Ellis & Harper, 1961) was suggested. Each subject's cooperation in not discussing the experiment was also solicited. Finally, those subjects who indicated on the consent form (Appendix A) a desire to know the results of the study were sent a summary letter (Appendix M).

Hypotheses

Phase I

Inasmuch as Phase I of the present investigation is an attempt to replicate Russell and Brandsma's (1974) research, the hypotheses, as stated below, address the same research questions posed in that study.

Hypothesis 1. Russell and Brandsma assume that individuals who attend to emotion-laden statements of a personal nature will respond to a measurably greater degree than will individuals attending to statements of a neutral and impersonal nature. This assumption receives support from their own research, as well as from other experiments (see Chapter I). Formally stated, Hypothesis 1 is:

Overall physiological responsivity to sentence dyads will be greater among experimental group subjects reading affectively-loaded dyads of both high and low relevance than among neutral group subjects reading dyads consisting of neutral, impersonal content.

Hypothesis 2. In operationalizing Ellis' theory of emotional disturbance, Russell and Brandsma also postulate that statements which involve highly relevant and personally significant issues will have greater emotional impact on the people attending to them than will statements of low relevancy. Based on this assertion, the following hypothesis was developed:



A subject's overall physiological responsivity will be greater to high-relevant sentence dyads than to low-relevant sentence dyads.

Hypothesis 3. Russell and Brandsma's model of RET further predicts that individuals will respond with greater emotional arousal to objective, non-affective statements involving high-relevant concerns than to the same type of statements which involve low-relevant concerns. (Table 2.3, referred to earlier in this chapter, graphically depicts both Hypotheses 2 and 3.) However, affect-laden, pejorative statements of a personal nature, regardless of relevancy, will elicit emotional arousal. Formally, this hypothesis predicts an interaction and may be stated as follows:

Physiological arousal to type-A sentences will be greater to high-relevant concerns than low-relevant concerns, while no differences will be obtained to type-B sentences. That is, for high-relevant dyads, there should be an approximately equal response to sentences A and B, but with low-relevancy dyads, a greater response to sentence B than to sentence A is predicted. Thus an interaction effect of relevancy with sentence type should be obtained.

Phase II

The Phase II hypotheses are concerned with the effects of treatment. Recall that Phase II attempts to answer two separate but related questions. First, how does the effectiveness of three analog treatments --which focus on verbal aspects of a problem--compare among the treatments and to a control group? The hypotheses generated to answer this question are based upon the assumptions tested in Phase I. That is, because the Phase II treatment of the three groups is directed at reducing emotional arousal to activating verbal stimuli (high-relevant, type-A sentences), then it must be shown in Phase I that type-A sentences of



high relevancy do, indeed, elicit greater emotional arousal than other types of statements. Failure to support this crucial assumption will render moot the Phase II hypotheses which are based upon it.

The second question does not rely on the Phase I results. The hypotheses related to this question involve the acquisition of emotional responses to verbal stimuli through verbal conditioning; they are presented later in this section.

Presupposing support for the assumptions tested in Phase I, the following hypotheses are formulated:

Hypothesis 4. It is expected that the language conditioning treatments--cognitive restructuring, semantic desensitization, and verbal flooding--will be effective in reducing overall emotional arousal to high-relevant sentence dyads. This hypothesis can be formally evaluated in two ways. First, the effectiveness of the language conditioning treatments can be compared to a control group. Formally stated, this hypothesis is:

As compared to a control group, the three language conditioning treatments will be more effective in reducing physiological arousal to sentence dyads of high personal relevancy.

Hypothesis 5. Second, the effectiveness of the language conditioning techniques can be evaluated by comparing each subject's response to both high- and low-relevant sentences. It is expected that successful treatment will reduce emotional arousal elicited by high-relevant statements to a low-relevant arousal level. Thus, Hypothesis 5 predicts that after treatment no differences between responses to high- and low-relevant sentence dyads will be obtained. Note that Hypothesis 4 involves a between-groups comparison, while Hypothesis 5 is a



within-subjects comparison. Precisely stated, Hypothesis 5 reads as follows:

Physiological responsivity will not differ between sentence dyads of both high- and low-relevant concern for subjects who have received language treatment. However, physiological responses to high-relevant sentences will be greater than to low-relevant sentences for control subjects.

Hypothesis 6. The differential effectiveness of the three language techniques will also be compared. It is expected that cognitive restructuring (CR) and semantic desensitization (SMD)--basically counter-conditioning procedures--will effect a greater reduction in emotional responses than will verbal flooding (VF), an extinction procedure. This hypothesis is based on the literature regarding counter-conditioning and extinction. Van Egeren, Feather, and Hein (1971), for example, found counter-conditioning to be superior to extinction in reducing fear of public speaking. Thus, the research hypothesis:

Subjects receiving cognitive restructuring and semantic desensitization treatments will evidence less emotional arousal to high-relevant sentence dyads than will those exposed to the verbal flooding treatment.

Hypothesis 7. It is also expected that the positive results characteristic of the treatments will generalize to some extent to other concerns. However, inasmuch as the CR treatment is a broader and more general therapeutic strategy than are the two specifically conditioning techniques, it is expected that the results of the CR group will generalize more easily. That is, because subjects in the CR group had an opportunity to learn a general, problem-solving, coping skill, it should transfer and show a greater degree of generalization to other problems. Formally stated, Hypothesis 7 reads:



Subjects receiving the cognitive restructuring treatment will evidence less emotional arousal to the second high-relevant sentence dyad than will the semantic desensitization and verbal flooding groups.

Hypothesis 8. This hypothesis deals specifically with the subjective rating used by each individual to designate the degree of concern for highly relevant problems. It is expected that, as a result of treatment, self-reported anxiety--subjective rating on the problem checklist--will be less for treatment groups than for the control group. Further, it is anticipated that the CR and SMD groups will report less anxiety than will the VF group for the same reasons as listed in Hypothesis 6 above. Specifically:

Self-reported anxiety, as measured by the degree of relevancy on the Coed Problem Checklist for high-relevant concerns, will be less for all treatment groups than for the control group. However, the treatment groups will differ among themselves, with the cognitive restructuring and semantic desensitization groups reporting less anxiety--having lower ratings--than the verbal flooding group.

Hypothesis 9. Hypotheses 9 and 10 relate to the attempt to develop in subjects emotional arousal to low-relevant concerns, specifically to type-A sentences. Inasmuch as Russell and Brandsma's model of RET is along classical conditioning lines, the hypothesized process of learning emotional arousal was tested in the present study. By pairing negatively-valenced words with key words representing low-relevant concerns, emotional arousal to the low-relevant concerns was expected to increase. Thus:

The negative semantic conditioning group is expected to evidence greater emotional arousal to the sentence dyad of low relevancy than the control group.



Hypothesis 10. As in the above hypothesis, the negative semantic conditioning treatment is also expected to increase self-reported anxiety to low-relevant concerns. Specifically:

The negative semantic conditioning procedure will result in significantly higher ratings for the Coed Problem Checklist least relevant concern than will a control group.

Experimental Design

Consistent with the procedures described earlier in this chapter, and with the associated hypotheses presented above, the basic experimental plan for this study involves a design over a series of repeated measures with eight dependent variables at each measurement point. Inasmuch as each subject is exposed to all levels of the design over the repeated measures, this design can be viewed as a within-subjects design. However, the design over the measures, as well as the design over the subjects, differs from Phase I to Phase II. These differences are described below.

Parenthetically, it should be noted that some authors (e.g., Johnson and Lubin, 1972, pp. 143-147) are critical of the widespread use of repeated measures designs in psychophysiological research. This criticism is based on the fact that repeated measures analyses introduce three major sources of potential error: (a) unequal correlations between observations, a violation of the assumption of homogeneous variances and covariances across all occasions; (b) measurement carryover; and (c) treatment carryover. Both (a) and (b) are potential sources of error in the present study and have been addressed as follows:



First, the assumption of homogeneous variances and covariances across all occasions, as Johnson and Lubin (1972) have pointed out, is often not tenable for repeated measures designs. This is because covariances between measurement points close together in time will generally be higher than between distant points. However, Finn (1969) has developed a general model for the analysis of data when the same subjects are measured repeatedly and when at least some of the effects of interest are in the measurement variables (as is the case in the present study), and his model is not restricted to the homogeneity assumption. As noted in the analysis section below, this model will be tested in the present study.

Second, measurement carryover as a potential source of error has been accounted for by counterbalancing the order of the presentation of the repeated measures variable (relevancy) among subjects.

Phase I

The only exception to the basic experimental plan introduced above involves the design necessary for Hypothesis 1; i.e., experimental group subjects ($n=34$) will exhibit greater physiological responsiveness than neutral group subjects ($n=16$). A completely randomized design with two treatment levels, no repeated measures (they are collapsed for this analysis), and eight dependent variables was associated with Hypothesis 1. This design is graphically portrayed in Table 2.5.

The remaining two hypotheses pertinent to Phase I involve only experimental subjects ($n=34$). The experimental plan incorporates a 2×2 design over the four repeated measures in Phase I. Since all



subjects received the same treatment, there was no design over the subjects. Of interest in this analysis was the differential responsiveness of subjects to the four sentences (repeated measures). This particular design allows for tests of the main effects of problem relevancy and sentence type and the interaction effect between the two. Table 2.6 provides a pictorial representation of the major Phase I design.

Table 2.5

Experimental Design Associated With Hypothesis 1

Independent Variables	Dependent Variables
Neutral Sentence Group (n=17)	8 Physiological Measures
Emotive Sentence Group (n=34)	8 Physiological Measures

Phase II

The Phase II experimental plan was an extension of Phase I. However, instead of four repeated measures (sentences), eight were sampled. Further, subjects were divided into five treatment groups. Thus, the experimental strategy involved a $2 \times 2 \times 2$ design over the repeated measures and a one-way design with five levels over the subjects. This design adds a third factor--generalizability--to the Phase I repeated measures 2×2 design. The generalizability factor includes two levels. The first encompasses all four sentences involved in the highest and lowest relevant concerns, while the second



Table 2.6
Experimental Design Associated With Hypotheses 2 and 3

Repeated Measures				
High Relevant Dyad			Low Relevant Dyad	
Sentence A		Sentence B	Sentence A	Sentence B
S_1	8 Physiological Dependent Variables			
S_2				
S_3				
.				
.				
.				
S_{33}				
S_{34}				

level is composed of the second high-relevant and second low-relevant concerns. (Each subject identified two high-relevant and two low-relevant problems on the Coed Problem Checklist.) Note that all 50 subjects are included in the design for Phase II, which is shown in Table 2.7.



Table 2.7

Experimental Design Associated With Phase II Hypotheses

		A ₁				A ₂			
		B ₁		B ₂		B ₁		B ₂	
		C ₁	C ₂	C ₁	C ₂	C ₁	C ₂	C ₁	C ₂
T ₁	S ₁	8 Physiological Dependent Variables							
	S ₁₀								
T ₂	S ₁₁								
	S ₂₀								
T ₃	S ₂₁								
	S ₃₀								
T ₄	S ₃₁								
	S ₄₀								
T ₅	S ₄₁								
	S ₅₀								

Repeated Measures

A = Generalizability

B = Relevancy High
 Low

C = Sentence Type A
 B

T₁ = Cognitive Restructuring

T₂ = Semantic Desensitization

T₃ = Verbal Flooding

T₄ = No Treatment Control

T₅ = Negative Semantic
Conditioning



Analysis

The data for Hypothesis 1 were analyzed using a one-way multivariate analysis of variance (MANOVA). All eight physiological variables were included in this analysis. (See Van Egeren, 1973, for a discussion of multivariate statistical analysis in psychophysiological research.) Univariate ANOVAs were also performed to test for treatment effect on the eight variables individually. The multivariate program used to calculate this analysis was developed and is described by Finn (1975).

The remaining two Phase I hypotheses were also run on the Finn (1975) multivariate program but involved a repeated measures analysis.

Likewise, the Phase II analysis used the Finn program to calculate the results. In addition to the repeated measures effect, treatment effects can also be tested using the Finn program. Because of the a priori predictions concerning treatment effects, a planned comparison approach, instead of an overall test of the model, was employed in Phase II. The alpha level for the Phase I and Phase II hypotheses is .05. The results are presented in Chapter III.



CHAPTER III

RESULTS

Chapter III contains the statistical analyses of the results of the study. The analyses relevant to each of the 10 hypotheses will be reported in turn. Again, as in Chapter II, the hypotheses and associated findings will be discussed within a Phase I-Phase II framework. Following the presentation of the results of the statistical analysis, Chapter III will conclude with a discussion of the subjects' responses to the Follow-up Questionnaire.

Many of the statistical analyses reported in this chapter were calculated on the Control Data Corporation 6500 computer system in the computer center at Michigan State University.

Phase I

Three hypotheses were of interest in this portion of the experiment. These three hypotheses duplicate those in the Russell and Brandsma (1974) study. Further, they serve as a basis for several of the remaining hypotheses. The results of the analyses which test these three hypotheses are reported below.

Hypothesis 1

Hypothesis 1 deals with the question of whether experimental group subjects reading emotive, personal sentences would show greater overall physiological responsiveness than neutral group subjects



reading neutral, impersonal sentences. This hypothesis was tested by collapsing all four Phase I sentences--repeated measures--and examining the differences between the two groups on the eight physiological variables. Table 3.1, which displays the results of the analysis, shows that the overall responsivity of the two groups differs significantly ($p < .04$). The univariate F s also found in Table 3.1 indicate that the between-group differences in heart rate (HR) and respiration rate (RR) contribute most to the multivariate F . In addition, between-group differences in skin conductance response (SCR) approach significance.

The group means of the eight physiological variables are presented in Table 3.2. The figures appearing in Table 3.2 are mean responses to four stimulus sentences. To help orient the reader to the kind of physiological changes indicated by the group means, a brief review of each variable follows.

Recall that skin conductance response (SCR) is the amplitude of the first skin response--measured in micromhos--to each stimulus sentence. Likewise, skin conductance total (SCT) is the total amplitude of all SCRs to a stimulus sentence. Table 3.2 indicates that experimental subjects showed larger skin responses, both initially and throughout the sentence trials, than did neutral group subjects. However, neutral group subjects appear to have responded more frequently (SCF) throughout Phase I than did experimentals. Note that these differences are not significant and may represent chance fluctuations.



Table 3.1
Multivariate and Univariate Tests for Differential
Effects of Experimental and Neutral Sentences
Upon Eight Physiological Measures

Multivariate				
<u>F</u> Ratio = 2.2405		<u>p</u> < .0438	D.F. = 8,41	
Univariate				
Variable	MS (error)	MS (Hypotheses)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	117.2613	332.5618	2.7508	.10
SCF	37.0410	40.5331	1.0943	.30
SCT	379.1332	239.9596	.6329	.43
DPA	2750.8054	1546.1480	.5621	.46
DBV	7211.4821	8980.2625	1.2453	.27
HR	504.0180	2166.8445	4.2991	.04
RD	14956.5933	9211.6167	.6159	.44
RR	224.5569	951.8376	4.2387	.05
D.F. for Hypothesis = 1				
D.F. for Error = 48				



Table 3.2
Observed Cell Means of Experimental and Neutral
Group Subjects on Eight Physiological Variables

Variable	Experimental Group (n=34) Mean	Neutral Group (n=16) Mean
SCR (micromhos)	14.60	9.15
SCF (frequency)	10.88	12.81
SCT (micromhos)	26.29	21.59
DPA (% change)	305.14	317.06
DBV (% change)	462.86	434.13
HR (change in beats/min.)	32.05	17.94
RD (% change)	446.90	476.00
RR (change in beats/min.)	-1.80	-11.16

Note: Each variable is the average of the subjects' responses to four stimulus sentences.

The three cardiac variables also indicate differential responsiveness between the two groups. The cardiac variables are relative measures which reflect response changes from pre- to during-stimulus exposure. The cardiac changes are as follows: Heart rate (HR) increases in both groups but to a significantly greater degree for experimental subjects than for neutral subjects. Likewise, vasoconstriction, as indicated by percentage change in digital pulse amplitude (DPA), is evident in both groups, but the experimental subjects show greater, though nonsignificant, vasoconstriction than neutrals. The changes in digital blood volume (DBV) appear to be inconsistent



with changes in DPA. Table 3.2 shows that percentage change in DBV from pre- to during-stimulus exposure is in the opposite direction of vasoconstriction; that is, a greater volume of blood appears in the thumb after stimulus exposure. Thus, one cardiac variable indicates vasoconstriction, while the other suggests vasodilation.

Raskin, Kotses, and Bever (1969) obtained similar results in a study investigating differential physiological arousal in orienting and defensive reflexes. As in the present study, Raskin et al. obtained decreases in cephalic pulse amplitude and increases in cephalic blood volume. The authors suggest that increased heart rate may produce increases in blood volume (in the present case digital blood volume) "even in the presence of local arterial constriction" (p. 157). They cite Abramson (1967) as supporting the contention that "this process may be partially a result of changes occurring in the venous system, since veins may contract and relax independently from arterioles" (Raskin et al., 1969, p. 157). Thus, the vasomotor responses in the present study apparently measure somewhat independent vascular processes and should not be expected to co-vary consistently.

The means of the respiration measures, as indicated in Table 3.2, show that for both groups respiration depth (RD) increased, while respiration rate (RR) decreased. These results are not unexpected, inasmuch as a subject typically took a deep breath to begin reading the sentence aloud and while reading took fewer breaths than during the quiescent pre-stimulus period. However, the respiration means also suggest that the experimental group subjects took shallower breaths



(nonsignificant) and inhaled more frequently (significant) than did the neutral group subjects.

To summarize the physiological responses to stimulus exposure, it appears that, overall, subjects tended to respond to stimulus sentences with a good deal of skin conductance activity, an increase in heart rate and vasoconstriction, and deeper and less frequent breathing. In spite of the consistency of physiological changes across groups, the degree of physiological responsiveness does differentiate between experimental and neutral group subjects. Experimentals show a significantly greater increase in heart rate and significantly slower respiration rate. Further, the group mean trends suggest that experimentals tend to produce a greater amount of skin conductance activity, experience more vasoconstriction, and take shallower breaths than do neutrals. These kinds of physiological changes have been characterized as typical of emotional arousal (e.g., Dykman, Reese, Galbrecht, & Thomasson, 1959; Lader, 1967).

Thus, it can be concluded that exposure to emotive, personal sentences results in greater emotional arousal than exposure to neutral, impersonal sentences. The predictions of Hypothesis 1 are supported by these findings.

Hypotheses 2 and 3

The remaining Phase I predictions involve differing responses to problem-relevancy and sentence-type by experimental subjects. Therefore, the repeated measures analysis of these hypotheses involves only the 34 experimental subjects.



Hypothesis 2 predicts that the overall emotional arousal of the 34 subjects will be significantly greater to high-relevant sentence dyads than to low-relevant sentence dyads, while Hypothesis 3 predicts an interaction effect between relevance and sentence-type (see Table 2.3). The 2 x 2 repeated measures MANOVA which tests these hypotheses is presented in Table 3.3.

Table 3.3

Multivariate Test of 2 x 2 Design Over Repeated Measures
Upon Eight Physiological Variables (Phase I)

Source	D.F.	<u>F</u> Ratio	<u>p</u> Less Than
Problem Relevancy (High vs. Low)	8,26	1.3958	.24
Sentence-Type (A vs. B)	8,26	2.0830	.08
Interaction	8,26	.5759	.79

Logically, the first hypothesis to be examined is Hypothesis 3, the interaction hypothesis. With 8 and 26 degrees of freedom, the MANOVA F ratio for interaction is .5759 (p < .79). Clearly, responses to sentence-type do not differ in any systematic fashion with respect to problem-relevancy. The univariate Fs related to the interaction hypothesis are presented in Table 3.4, and it is additionally evident that nothing in the data supports an interaction effect. Thus, in contrast to Russell and Brandsma's results, Hypothesis 3 was not confirmed.



Table 3.4
Univariate Tests for Interaction Effects of
Problem Relevancy With Sentence Type

Variable	MS (Error)	MS (Hypothesis)	<u>F</u> Ratio	<u>p</u> Less Than
SCR	.6861	.5175	.6085	.44
SCF	.2881	.1176	.4084	.53
SCT	2.0003	.0903	.0452	.83
DPA	133.6960	8.9483	.0669	.80
DBV	400.0629	22.1296	.0553	.82
HR	9.2892	29.4113	3.1662	.08
RD	401.0552	19.0239	.0474	.83
RR	8.3221	10.1480	1.2194	.28
D.F. for Hypothesis = 1				
D.F. for Error = 33				

Hypothesis 2, concerning the problem-relevancy main effect, i.e., that responses to high- and low-relevant sentence dyads will differ, also fails to obtain support in the multivariate analysis. As seen in Table 3.3, the F ratio of 1.3958 for problem-relevancy has a p value of less than .24. Consequently, the eight physiological variables taken together do not distinguish between the relevancy of sentence dyads.

An inspection of the univariate Fs related to Hypothesis 2 (Table 3.5), however, reveals that one of the eight physiological variables, skin conductance total (SCT), does discriminate between

Table 3.5
Univariate Tests for Problem Relevancy Main Effects

Variable	MS (Error)	MS (Hypothesis)	F Ratio	p Less Than
SCR	4.6297	9.5453	2.0617	.16
SCF	1.5740	3.5588	2.2610	.14
SCT	8.2463	65.3166	7.9208	.01
DPA	254.8731	22.9848	.0902	.77
DBV	2086.0649	1189.9206	.5704	.46
HR	68.9767	267.6497	4.0108	.05
RD	2262.8351	3502.8665	1.5480	.22
RR	39.6157	12.5176	.3160	.58
D.F. for Hypothesis = 1				
D.F. for Error = 33				

high- and low-relevant problems to a significant degree ($p < .01$). It is recognized that analyzing the effects of the independent variables upon a single dependent measure, without regard for potential effects upon other dependent variables (the univariate approach), has crucial statistical implications, particularly for decisions about the level of significance. However, because of the importance of Hypotheses 2 and 3 to several of the Phase II hypotheses, it is important that even the weakest of systematic Phase I trends be noted. Thus, relative to the significant univariate F (SCT) seen in Table 3.5, I cautiously suggest that it provides very modest, though admittedly equivocal, support for Hypothesis 2.

The possibility of finding other kinds of "support" for the Phase I hypotheses suggests several additional analyses. These additional analyses, which are felt to have potential relevance to the contingent Phase II hypotheses, were performed and are reported below.

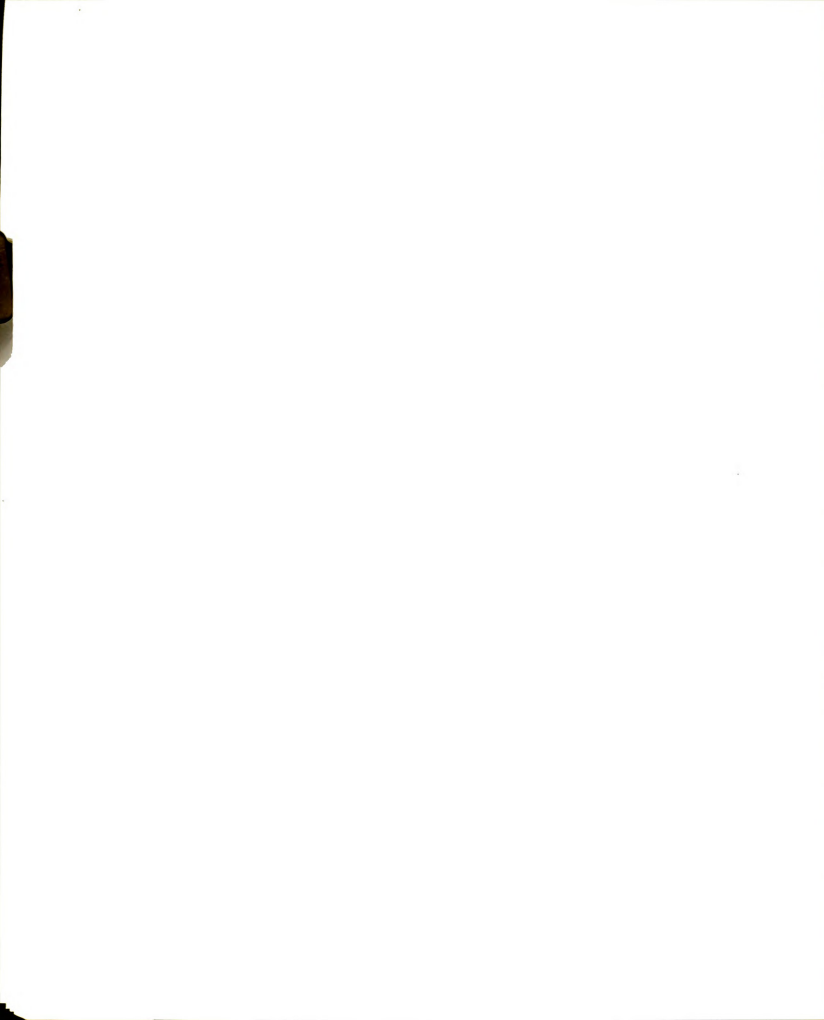
Before reporting these additional analyses, however, we return to Table 3.3, where it must be noted that the main effect for sentence-type approaches statistical significance ($p < .08$). Realize that a main effect for sentence-type was not predicted. Rather, responses to type-A and type-B sentences were expected to differ only with respect to the relevancy of the particular sentence dyad (interaction effect). The fact that significance for the sentence-type main effect was almost obtained suggests that subjects may have responded differentially to sentences A and B regardless of relevancy. An inspection of cell means in Table 3.6 indicates that subjects may have been somewhat more physiologically responsive to A sentences than to B sentences. Inasmuch as sentence A always preceded sentence B within a particular sentence dyad, it is conceivable that some kind of ordering effect may have taken place. But, since the order of presentation of sentence-type was not included in this study as a design variable, that possibility cannot be properly addressed.

The additional analyses performed on the Phase I data, which were alluded to above, involve two one-way MANOVAs. These two separate, one-way MANOVAs are intended to partition the analysis of the problem-relevancy main effect. The problem-relevancy main effect (Hypothesis 2) was designed to test the possibility that subjects responded differently to high-relevant sentence dyads than to dyads of low relevance. The

Table 3.6
Observed Cell Means and Standard Deviations of
34 Subjects on Eight Physiological Variables
at Four Data Points (Phase I)

Variable		High		Low	
		A	B	A	B
SCR (micromhos)	$\bar{X}$	4.31	3.52	3.56	3.21
	SD	4.13	3.87	3.66	2.74
SCF (frequency)	$\bar{X}$	2.85	2.91	2.65	2.47
	SD	2.06	1.88	1.94	1.56
SCT (micromhos)	$\bar{X}$	7.64	6.89	6.15	5.60
	SD	7.27	6.04	5.83	4.39
DPA (% change)	$\bar{X}$	76.94	76.45	75.09	76.65
	SD	22.93	21.08	16.74	21.54
DBV (% change)	$\bar{X}$	111.14	126.20	106.84	118.67
	SD	16.10	80.94	17.23	30.91
HR (change in breaths/min.)	$\bar{X}$	10.76	8.11	6.05	7.12
	SD	9.96	7.14	9.26	9.54
RD (% change)	$\bar{X}$	125.88	107.72	114.23	99.07
	SD	52.61	54.73	51.17	32.32
RR (change in breaths/min.)	$\bar{X}$	-3.40	1.89	-1.70	1.40
	SD	3.79	7.80	7.09	6.82

one-way MANOVAs address the same question but include only one sentence of each dyad in the analysis. It seems plausible that the repeated measures approach--which allowed for a test of the interaction effect--might have obscured differences in subjects' responses to high- and low-relevant concerns, because both sentences were analyzed together. Consequently, the results of the one-way MANOVAs test the



possibility that differences exist between (a) high- and low-relevant A sentences and (b) high- and low-relevant B sentences.

The results of the first MANOVA are reported in Table 3.7. The multivariate F ratio of 1.2683 with D.F. of 8 and 26 has a non-significant p value of less than .30, indicating no differences between responses to type-A sentences when the entire system of dependent variables is analyzed. When analyzed in univariate fashion (also seen in Table 3.7), two of the eight variables--SCT and HR--do appear to discriminate between the two kinds of A sentences. However, it must be realized that an alpha level of .05 for each of the univariate F s results in a .40 probability of falsely rejecting a null hypothesis among the eight variables; consequently, these "significant" univariate F s may be spurious. To control the alpha level of each univariate analysis, the overall alpha of .05 should be partitioned among the eight variables such that the rejection region for each variable lies between $.006 > p < .007$. Obviously, the two "significant" univariate F s fall far short of that criterion (SCT $p < .03$; HR $p > .03$). Thus, there is nothing in the data to suggest that the physiological responsivity of subjects differs between high- and low-relevant, type-A sentences.

The results of the second MANOVA--comparing responses between high- and low-relevant, type-B sentences--are reported in Table 3.8. Clearly, type-B sentences do not discriminate in terms of responses to high- or low-relevant concerns. Although this result is predicted in Hypothesis 5, the concomitant interaction was not obtained (i.e., there was no response difference among type-A sentences). Thus,

although it supports Hypothesis 5, this finding is both trivial and uninterpretable.

Table 3.7
Multivariate and Univariate Tests for Sentence-A Effects
Upon Eight Physiological Variables

Multivariate				
<u>F</u> Ratio = 1.2683		<u>p</u> < .3020	D.F. = 8,26	
Univariate				
Variable	MS (Error)	MS (Hypotheses)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	1.2232	4.8000	3.9241	.06
SCF	.6482	.3603	.5559	.46
SCT	3.7780	18.8485	4.9890	.03
DPA	175.1266	29.0358	.1658	.69
DBV	121.6106	157.3370	1.2938	.26
HR	36.8706	188.7769	5.1200	.03
RD	1001.5838	1152.8841	1.1511	.29
RR	11.7287	24.5480	2.0930	.15
D.F. for Hypothesis = 1				
D.F. for Error = 33				

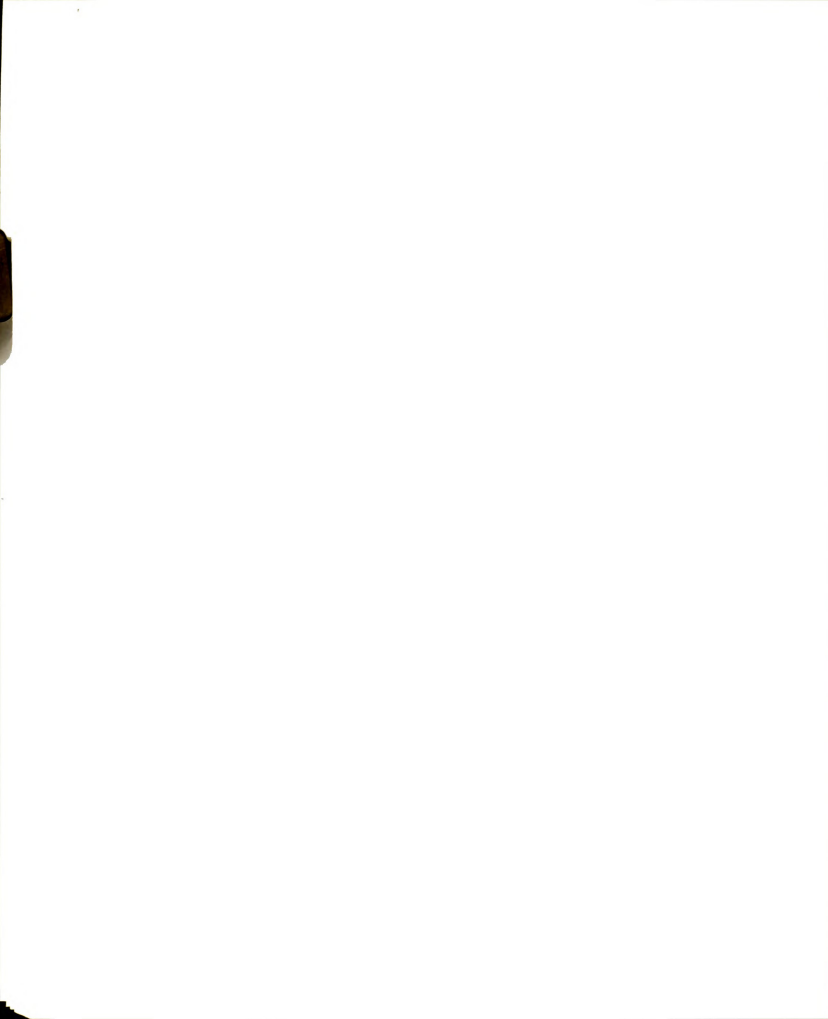


Table 3.8
Multivariate and Univariate Tests for Sentence-B Effects
Upon Eight Physiological Variables

Multivariate				
<u>F</u> Ratio = 1.0465		<u>p</u> < .4285	D.F. = 8,26	
Univariate				
Variable	MS (Error)	MS (Hypotheses)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	2.4639	.8067	.3278	.57
SCF	.7150	1.6544	2.3138	.14
SCT	4.3458	13.9905	3.2193	.08
DPA	219.7019	.3531	.0016	.97
DBV	1721.5478	481.8824	.2799	.60
HR	16.1962	8.3705	.5168	.48
RD	931.9421	636.5969	.6831	.41
RR	24.7234	2.0067	.0812	.78
D.F. for Hypothesis = 1				
D.F. for Error = 33				

In summary, the results of the present study support the hypothesis that personally-oriented, emotionally-laden statements produce greater emotional arousal than impersonal, affectless statements (Hypothesis 1). However, significant effects for either the problem-relevancy variable (Hypothesis 2) or for an interaction between



problem-relevancy and sentence-type (Hypothesis 3) was not obtained. The fact that minimal and rather tenuous support for Hypothesis 2 was obtained (significant SCT) does not alter the broader negative findings noted above. Overall, then, the Russell and Brandsma results were not confirmed by the present study.

Phase II

As noted in Chapter II, nonsignificant Phase I results will render meaningless a major portion of the Phase II analysis. A brief review of the relationship between the two phases will help to clarify this assertion. The Phase II analog treatments were designed to diminish maladaptive emotional reactions to certain stimulus events--in this case, to objective and factual self-statements of a personal, concern-related nature (type-A sentences). This objective is not dissimilar to many psychotherapeutic goals, and in the present study its accomplishment basically involved an attempt to alter the significance or valence of the emotion-producing self-statements. However, if a "client" is not experiencing maladaptive emotional reactions relative to the target concern and its associated self-statements--or if her emotional arousal is no greater for the target problem than for irrelevant problems (Phase I results)--then attempts to reduce emotional arousal to the target concern are pointless. In other words, since inordinately high emotional arousal does not exist, it cannot be reduced.

This, then, is the problem as the Phase II results are considered. Clearly, the Phase I results obviate the need for the

analyses originally proposed for Phase II. However, trends among or within the treatments might be observed in the cell means. Also, some speculations about the reasons for the lack of Phase I results might suggest a different way of looking at the data and make available another means of comparing treatment effectiveness. In addition, the effects of treatment upon subjective anxiety--as measured by post-treatment ratings on the Coed Problem Checklist--might provide some insight regarding differential treatment effectiveness. Finally, the analysis of the negative semantic conditioning (NSC) procedure--unrelated to Phase I results--will also be of interest as we consider the Phase II data.

The remainder of the discussion involving the Phase II results will be ordered to conform to the topics listed above.

Cell Means

The cell means of most interest to the Phase II analyses are those involving the high-relevant, type-A sentences. This was the experimental stimulus to which the language conditioning treatments were directed. After treatment, physiological arousal to the type-A sentences was to have been significantly reduced (Hypothesis 4). The cell means of the three treatments and the no-treatment control group are presented in Table 3.9. A visual comparison of these means does not show any systematic trends among the treatments. In fact, if any trends do exist, they appear to be in the opposite direction of the hypotheses. For example, both SCF and SCT are lowest for the no-treatment control group and highest for the cognitive restructuring group, suggesting more physiological arousal for treatment

group subjects than for controls. A one-way MANOVA was employed to formally test this possibility. The control group was compared to the average of the three treatment groups, and, as seen in Table 3.10, neither the multivariate test ($p < .95$) nor any of the univariate tests support this hypothesis.

Table 3.9
Cell Means and Standard Deviations of Eight Dependent
Variables Across Four Treatment Groups for the High-
Relevant, Type-A Sentence (Phase II)

Treatment Group (n=10)		Variable							
		SCR	SCF	SCT	DPA	DBV	HR	RD	RR
CR	$\bar{X}$	5.41	2.80	9.07	80.57	104.10	6.11	96.31	-2.74
	SD	4.05	2.30	7.60	22.99	11.82	6.39	20.22	4.76
SMD	$\bar{X}$	2.64	2.40	5.51	68.31	102.29	4.49	112.93	.45
	SD	2.86	1.08	3.54	15.85	14.27	7.18	44.47	4.66
VF	$\bar{X}$	3.44	1.90	4.92	69.50	110.66	5.82	121.02	-2.31
	SD	3.32	1.73	5.17	16.36	8.31	5.71	29.08	7.94
NTC	$\bar{X}$	3.67	1.70	4.13	73.16	103.88	6.18	111.35	-3.12
	SD	2.84	1.06	3.23	17.67	15.15	7.18	33.27	4.40

Table 3.10
Multivariate and Univariate Tests for Treatment Effects
Upon Eight Physiological Variables for High-Relevant,
Type-A Sentences (Phase II)

Multivariate				
<u>F</u> Ratio = .3270		<u>p</u> < .9488	D.F. = 8,29	
Univariate				
Variable	MS (Error)	MS (Hypothesis)	<u>F</u> Ratio	<u>p</u> Less Than
SCR	10.9137	.1952	.0179	.89
SCF	2.6389	3.3333	1.2632	.27
SCT	26.8493	42.2928	1.5752	.22
DPA	339.9718	1.0212	.0030	.96
DBV	160.4091	24.2730	.1513	.70
HR	44.1164	3.7843	.0850	.77
RD	1084.6974	12.0397	.0111	.92
RR	31.6912	18.8734	.5955	.45
D.F. for Hypothesis = 1				
D.F. for Error = 36				

Hypothesis 5 makes a prediction similar to Hypothesis 4 but from a within-subject perspective, i.e., that responses to high- and low-relevant sentences would not differ for treatment group subjects, while the Phase I differences would be obtained by controls. Both



the negative Phase I results--where initial response differences between high- and low-relevant sentences were not found--and the above cell means (Table 3.9)--where the physiological responsivity of controls is less than for treatment group subjects--preclude any meaningful analysis of Hypothesis 5. Nevertheless, the mean-response differences between high-relevant, type-A sentences and low-relevant, type-A sentences for each group is presented in Table 3.11. Again, systematic trends are nonexistent.

Table 3.11
Differences Between Mean Responses to High- and Low-
Relevant, Type-A Sentences for Eight Physiological
Variables Across Treatment Groups

Treatment Group (n=10)	Variable							
	SCR	SCF	SCT	DPA	DBV	HR	RD	RR
CR	1.28	1.1	4.54	- .70	-36.26	3.88	-15.41	- .54
SMD	-3.08	.7	-1.05	- 2.85	- 7.23	-1.97	- 3.22	-2.45
VR	- .10	.1	- .39	-12.04	8.78	3.81	7.60	-3.01
NTC	1.00	.1	.77	2.08	-10.35	1.98	- .95	.16

Note: Negative sign indicates an increase in response from high- to low-relevant, type-A sentences.

Hypothesis 6 proposes that differences in physiological responses to high-relevant sentences between treatment groups will be obtained, i.e., that cognitive restructuring (CR) and semantic desensitization (SMD) will show less arousal than verbal flooding (VF).



Trends in this direction are not evident in the high-relevant, type-A sentence cell means reported in Table 3.9. A multivariate test of this prediction, however, was performed and appears in Table 3.12. The nonsignificant multivariate F ratio ($p < .82$) formally corroborates the visual impression of no differences.

Table 3.12
Multivariate and Univariate Tests Comparing Treatment Effects
(Verbal Flooding Versus Cognitive Restructuring and Semantic
Desensitization) Upon Eight Physiological Variables for
High-Relevant, Type-A Sentences

Multivariate				
<u>F</u> Ratio = .5369		<u>p</u> < .8190	D.F. = 8,29	
Univariate				
Variable	MS (Error)	MS (Hypothesis)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	10.9137	2.3325	.2137	.65
SCF	2.6389	3.2667	1.2379	.27
SCT	26.8493	37.4776	1.3958	.25
DPA	339.9718	162.3615	.4776	.49
DBV	160.4091	372.4543	2.3219	.14
HR	44.1164	1.8096	.0410	.84
RD	1084.6974	1792.9573	1.6530	.21
RR	31.6912	8.9939	.2838	.60
D.F. for Hypothesis = 1				
D.F. for Error = 36				

Because the generalizability predicted in Hypothesis 7 is contingent upon the preceding hypotheses, a formal test of significance would be meaningless. Paralleling Hypothesis 5, however, the differences between responses to the first and second high-relevant, type-A sentences are presented in Table 3.13. Once again, systematic trends are absent.

Table 3.13

Differences Between Mean Responses to Both Phase II High-Relevant, Type-A Sentences for Eight Physiological Variables Across Treatment Groups

Treatment Group (n=10)	Variable							
	SCR	SCF	SCT	DPA	DBV	HR	RD	RR
CR	1.36	.20	2.05	2.89	3.40	-2.06	- 8.83	-.60
SMD	-2.41	-1.00	-2.49	-10.44	-6.80	- .31	-33.41	.21
VF	.69	.20	- .45	- 6.78	.92	4.89	10.44	.24
NTC	.67	.10	- .46	- 1.11	-9.76	-1.81	-13.64	.85

Note: Negative sign indicates an increase in response.

Summarizing the Phase II cell mean data discussed above, it appears that all differences seen among the cell means are due to error variance and do not represent true differences between groups.

A Speculation

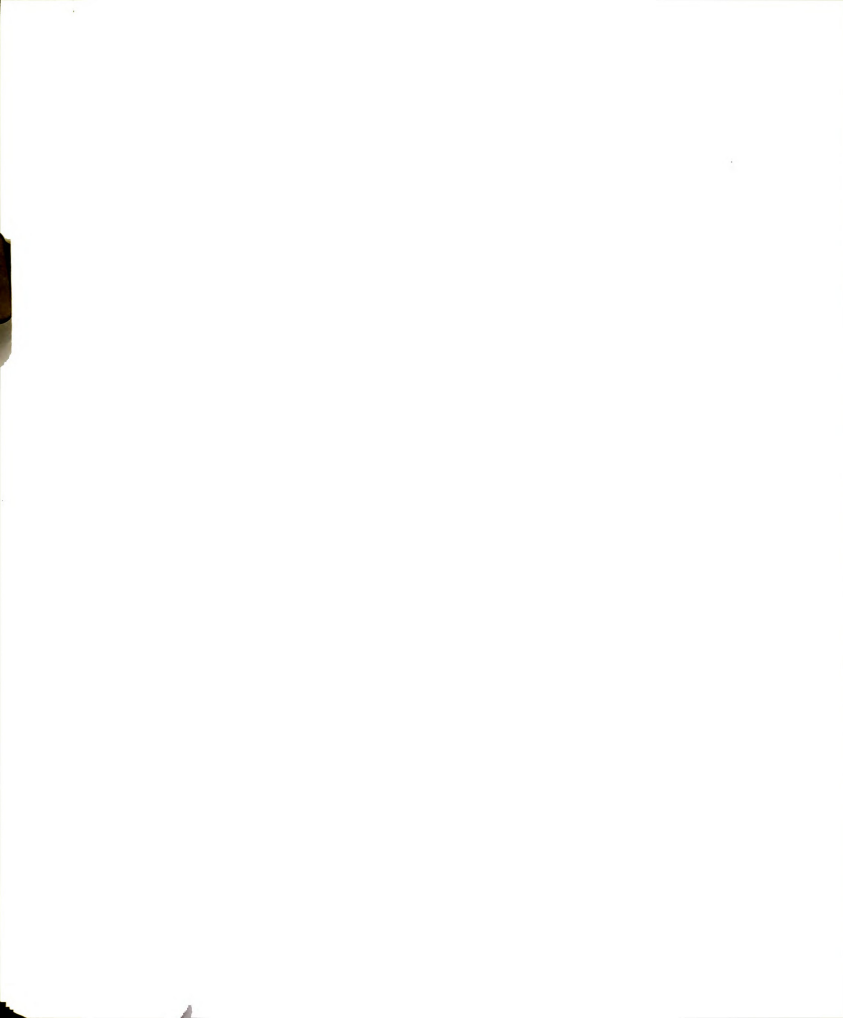
The fact that the Phase I hypotheses were not supported can be viewed in a number of ways. The Russell and Brandsma model of RET may



be a poor one; the sample in the present study may have somehow been unique and resulted in uniquely nonsignificant data; the instruments used to manipulate the independent variables might have been inadequate; the dependent variables might have been inappropriate; or the procedure might have obscured group differences. These various, alternative explanations of the results will be discussed in detail in Chapter IV. One additional possibility which has implications for the Phase II analysis is presented below.

As the subjects included in this study were mostly freshman and sophomore women, many of them were likely participating in their first psychological experiment. Upon entering the experimental room, they were confronted with a rather ominous-looking polygraph machine and its associated accessories. They were eventually attached to the polygraph by a male graduate student, who they were aware was monitoring their responses to personal, emotion-laden statements. It is conceivable that the subtle, and perhaps minimal, physiological differences predicted between high- and low-relevant sentence dyads were obscured by some kind of performance anxiety experienced by the subjects. In other words, expected differences might have been washed out as the result of a ceiling effect in the dependent variables. If this is the case, it seems reasonable to ask whether the various Phase II treatments were effective in reducing performance anxiety and, if so, how they compare to each other.

The first question is graphically answered in Table 3.9. Logically, any reduction in performance anxiety which occurs as a result of treatment is most likely to occur relative to the experimental



stimulus toward which the treatments were directed. However, a visual inspection of Table 3.9 does not reveal any trends among the treatment groups. In addition, the multivariate and univariate tests comparing treatment effectiveness--including a no-treatment control group--which are reported in Table 3.10 are nonsignificant.

An alternative way of simultaneously examining both of the questions posed above is to examine pre- and post-treatment differences among the groups. Again, the most meaningful approach to these questions is to investigate pre- and post-differences among groups to only one experimental stimulus--the high-relevant, type-A sentence. Only 27 of the 40 subjects in the treatment and control groups had relevant pre-test data; (the other 13 subjects were exposed only to neutral sentences in Phase I). Thus, only 27 subjects are included in this analysis.

The results, which contrast the control group to the average of the three treatment groups, are reported in Table 3.14. With 8 and 15 degrees of freedom, the multivariate F ratio of 1.4287 has a p value of less than .26. Likewise, the univariate F s are nonsignificant. Average pre- and post-differences within each dependent variable for each of the four groups of interest are reported in Table 3.15. As expected by virtue of these nonsignificant results, systematic trends among the groups are absent. Hence, as compared to a control group, language conditioning treatment did not reduce the hypothesized performance anxiety.



Table 3.14

Multivariate and Univariate Tests Comparing Pre- vs. Post-Treatment Effects Upon Eight Physiological Variables for High-Relevant, Type-A Sentences

Multivariate				
<u>F</u> ratio = 1.4287		<u>p</u> < .2583	D.F. = 8,15	
Univariate				
Variable	MS (Error)	MS (Hypothesis)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	2.2402	5.1953	2.3191	.14
SCF	.4325	1.7202	3.9779	.06
SCT	10.1174	5.6528	.5587	.46
DPA	321.1159	255.9826	.7972	.38
DBV	95.0336	.0700	.0007	.98
HR	29.9985	10.8563	.3619	.55
RD	773.2908	284.1020	.3674	.55
RR	7.1191	5.2517	.7377	.40
D.F. for Hypothesis = 1				
D.F. for Error = 23				



Table 3.15

Differences Between Pre- and Post-Treatment Mean Responses
to High-Relevant, Type-A Sentences for Eight Physiological
Variables Across Treatment Groups

Treatment Groups	Variable							
	SCR	SCF	SCT	DPA	DBV	HR	RD	RR
CR (n=7)	- .37	.29	3.63	-10.34	7.13	2.22	25.14	-2.61
SMD (n=7)	1.87	.29	1.72	12.74	1.45	.64	- .91	.15
VF (n=7)	1.25	.29	3.52	11.26	9.53	7.41	-16.60	-1.59
NTC (n=6)	-1.20	1.50	- .95	-10.58	9.66	7.75	46.12	- .31

Note: Negative sign indicates an increase in response from pre-treatment to post-treatment.

Subjective Anxiety

Hypothesis 8 concerns the effects of treatment upon subjects' ratings of high-relevant concerns. After treatment, each subject was asked to re-rate 14 items on the Coed Problem Checklist. Two of the items had been previously selected by each subject as high-relevant concerns and two others as low-relevant concerns. The remaining 10 items were randomly selected and included only so that the four relevancy items could be rated in a relative context. Of interest to Hypothesis 8 is the re-rating of the concern of highest relevancy--the one toward which the treatments had been directed.

Table 3.16 presents both the pre- and post-treatment mean ratings of each group. In addition, the change in rating for each group is reported. It can be seen that the cognitive restructuring (CR)

and semantic desensitization (SMD) groups' mean ratings do not change, while for the verbal flooding (VF) and no-treatment control (NTC) groups, lower, though quite small, rating changes are evident.

Table 3.17 shows the ANOVA table for testing differences in post-treatment ratings among groups. A planned comparison approach using Helmert contrasts (Finn, 1975) is taken, and it is clear that the treatment groups do not differ from each other ($p < .07$; $p < .83$). We conclude that language conditioning treatments as represented in this study were not found to reduce subjective anxiety.

Table 3.16
Mean Coed Problem Checklist Ratings of
High-Relevant Items

	Ratings		
	Pre	Post	Change
CR	6.4	6.4	0
SMD	6.3	6.3	0
VF	6.1	5.7	-.4
NTC	6.1	5.4	-.7



Table 3.17

Post-Treatment Comparison of Coed Problem Checklist High-
Relevant Concern Ratings Using Helmert Contrasts

Contrast	MS (Error)	MS (Hypothesis)	Univariate F	p Less Than
NTC vs. <u>CR, SMD, VF</u> 3	1.0944	2.7000	2.4670	.13
VF vs. <u>CR + SMD</u> 2	1.0944	3.7500	3.4264	.07
CR vs. SMD	1.0944	.0500	.0457	.83
D.F. for Hypothesis = 1				
D.F. for Error = 36				

Negative Semantic Conditioning

Two Phase II hypotheses are not contingent upon Phase I results. Both are concerned with the attempt to induce emotional arousal to a low-relevant concern. This attempt is analogous to the acquisition of maladaptive emotional responses to verbal stimuli predicted in Stage 2 of Russell and Brandsma's model of RET. Hypothesis 9 states that emotional--physiological--arousal to low-relevant sentences will be greater for NSC subjects than for a control group. Hypothesis 10 predicts that the subjective ratings on the Coed Problem Checklist of these low-relevant concerns will be higher for negative semantic conditioning (NSC) subjects than for controls.

The multivariate test of Hypothesis 9 is found in Table 3.18. With 8 and 11 degrees of freedom, the multivariate F ratio of .8578 is

nonsignificant at $p < .58$. The univariate F s reported in the same table are likewise nonsignificant. Accordingly, when measured by these eight physiological variables, NSC does not create any more physiological responsivity to low-relevant, type-A sentences than does a no-treatment control (NTC) group.

Table 3.18

Multivariate and Univariate Tests Comparing Differential Effects of Negative Semantic Conditioning and No-Treatment Control on Eight Physiological Variables

Multivariate				
<u>F</u> Ratio = .8578		<u>p</u> < .5799	D.F. = 8,11	
Univariate				
Variable	MS (Error)	MS (Hypothesis)	Univariate <u>F</u>	<u>p</u> Less Than
SCR	16.7927	9.2208	.5491	.47
SCF	1.4889	3.2000	2.1493	.16
SCT	23.5794	54.6812	2.3190	.15
DPA	119.2687	2.4082	.0202	.89
DBV	264.3227	12.2618	.0464	.83
HR	80.2412	74.8071	.9323	.35
RD	2946.5632	3627.2018	1.2310	.28
RR	21.8029	3.7845	.1736	.68
D.F. for Hypothesis = 1				
D.F. for Error = 18				



Table 3.19 presents the pre- and post-treatment mean ratings of the low-relevant items on the Coed Problem Checklist for both the NSC and NTC groups. It was hypothesized that subjective ratings would indicate a higher degree of concern for NSC subjects than for NTC subjects. The differences between the mean ratings, however, are so minimal that statistical analysis is unwarranted. Thus, neither Hypothesis 9 nor 10 receives support in the present study.

Table 3.19
Mean Coed Problem Checklist Ratings of
Low-Relevant Items

	Ratings		
	Pre	Post	Change
NSC	1.0	1.3	+ .3
NTC	1.0	1.1	+ .1

Follow-up Questionnaire

The first two questions on the Follow-up Questionnaire (Appendix C) were intended to secure information about the validity of the Coed Problem Checklist. A report of the responses to Questions 1 and 2 is found in Chapter II.

Question 3 attempted to assess subject awareness of negative and critical "self-talk." The frequency and percentage of the degree of subject awareness are presented in Table 3.20. With respect to the high-relevant concerns which subjects had identified on the Coed Problem Checklist, 66% of all subjects indicated an awareness of negative

Table 3.20
Frequency and Percentage of Subjects Falling Within
Response Categories on Questions 3 and 4
of the Follow-up Questionnaire

Question	Frequently	Occasionally	Not Aware	No
3a) Thought Type-B sentences about high-relevant concern	11 (22%)	22 (44%)	10 (20%)	7 (14%)
3b) Thought Type-B sentences about other concerns	3 (6%)	27 (54%)	17 (34%)	3 (6%)

	Increase	Irregular Changes	No Change	Decrease	Don't Know
4. How were stimulus sentences to have affected:					
GSR	28 (56%)		3 (6%)		19 (38%)
HR	43 (86%)		2 (4%)		5 (10%)
RR	34 (68%)	3 (6%)	5 (10%)	1 (2%)	7 (14%)

"self-talk." The remaining 17 subjects were not aware of using type-B sentences. A surprising result is the relatively large number of subjects (14%) who responded with a definite "No" to Question 3(a). This is even more puzzling in light of the smaller number of subjects (6%) who also gave a definite "No" in response to Question 3(b). One would expect that awareness of negative self-statements would be greater



for highly relevant concerns than for other problem areas. A possible explanation of this finding is that the content of the type-B sentences flashed on the screen did not correspond to the subjects' interpretations of the Coed Problem Checklist high-relevant items upon which they were based. This possibility will be discussed further in Chapter IV.

In terms of frequency of responses to the global categories of awareness versus no-awareness, Question 3(b) closely parallels 3(a). That is, 60-65% of all subjects indicated some awareness of negative "self-talk," while 35-40% did not. It is difficult to assess this information in terms of counseling practice, inasmuch as cognitive restructuring therapeutic efforts are typically directed toward convincing the client of the irrationality of negative "self-talk" and its self-defeating effects rather than merely sensitizing the client to his internal dialogue. Since the Questionnaire does not address the issues of subject recognition of the irrationality of type-B sentences and their consequences, we are limited to concluding only that a majority of subjects were aware that they said type-B sentences to themselves on some occasions.

Question 4 attempted to assess the potential experimental demand characteristics inherent in the procedure and instrumentation. Table 3.20 reveals that a majority of subjects expected increased responsiveness in the three physiological variables about which they were questioned. However, in light of the negative results, the subjects' lack of knowledge about specific hypotheses, and the subjects'



probable performance anxiety, it seems unlikely that experimental demand characteristics played a part in the outcome of this study.

With the exception of the request for additional comments, the remainder of the questionnaire was relevant only to the three analog treatment groups. Question 5 asked what the respondent thought the goal of treatment was. The results are presented in Table 3.21. Interestingly, the majority of semantic desensitization (SMD) and verbal flooding (VF) subjects saw the "treatment" as related to the experiment and not to themselves. Accordingly, their responses mostly involved speculations about the purpose of the experiment. On the other hand, the majority of cognitive restructuring (CR) group subjects viewed the goal of treatment as the reduction of negative emotional responses or as greater self-awareness. These results are not surprising, inasmuch as CR group tapes were more explicit in discussing the treatment objective than were the SMD and VR instruction tapes. Again, in terms of experimental demand characteristics, the knowledge of the treatment goal did not affect the results of the study.

Question 6 related to the subjects' willingness to approach a counselor who practiced the kind of "therapy" to which they had been exposed during the experiment. Table 3.22 shows that about 30% of all treatment groups (five for CR, three each for SMD and VF) would seek out such a counselor, although five subjects gave no reason for their positive response. Three CR subjects responding positively to Question 6 liked the rational, objective approach presented in the tape recording. Two VF subjects appreciated the fact that they would not have to talk directly with a counselor using a VF technique and



expressed a willingness to see a counselor on that basis. One subject who received the SMD "treatment" thought it would be a time-saving approach to therapy.

Table 3.21

Categories and Frequencies of Subjects Within Each Treatment Group Responding to the Question: "What Do You Think Was the Goal of the Treatment You Received?"

Goals of Treatment	CR n=10	SMD n=10	VF n=10
<u>Treatment Related</u>			
1. Alter emotional responses	5		1
2. Self-knowledge or self-disclosure	<u>2</u>	<u>2</u>	<u>—</u>
Sub-Total	7	2	1
<u>Experiment Related</u>			
1. Investigate correlation between problems checked and responses	2	7	7
2. Investigate women's attitudes	<u>1</u>	<u>1</u>	<u>1</u>
Sub-Total	3	8	8
<u>Other</u>			
Don't know			1



Table 3.22

Categories and Frequencies of Subjects Within Each Treatment Group
Responding to the Question: "If You Had a Personal Problem With
Which You Wanted Help, Would You Choose a Counselor Whose Approach
Is Similar to the One to Which You Were Exposed Today?"

	CR	SMD	VF
YES	2		
PROBABLY	3	3	3
Why?			
1. Appealed to my reason, an objective approach	3		
2. Indirect--don't have to talk with counselor			2
3. Efficient, time-saving		1	
4. No reason	2	2	1
PROBABLY NOT	4		3
NO	1	4	2
Why not?			
Impersonal	1	1	3
Too general	1		
Felt ridiculed	1		
No opportunity to talk		1	1
Irrelevant, ineffective	2	1	
No reason		1	1



Five SMD and VF subjects were not included in Table 3.22, because they appear to have confused "treatment" with the experiment as a whole. They stated that they would go to a counselor using a similar approach, because the "electronic analysis" of their problems was undoubtedly more accurate than a "regular" counselor's analysis. Obviously, they were not affirming the verbal conditioning procedure.

About 50% of all subjects indicated that they would not go to a counselor using the treatment approach to which they had been exposed. Reasons varied among treatment groups, but "too impersonal" was a popular choice, particularly for VF subjects. One CR subject felt the tape was too general; another felt she had been ridiculed; and, like one SMD respondent, two CR subjects evaluated the procedure as irrelevant and ineffective. In contrast to the two subjects in the VF group who liked the idea of not having to talk, two other verbal conditioning subjects would not go to a similar counselor, because there was no opportunity to talk. No reason was given by two subjects for their negative responses to Question 6.

These results hold no particular surprises. The criticisms leveled at the RET-like treatment, CR, are not unfamiliar, and the negative responses to the verbal conditioning procedures seem reasonable. It should be emphasized again, however, that the "treatments" the subjects evaluated are merely analogs and can be considered as representative in only limited ways.

Many of the additional comments requested of subjects were general in nature. For example, general comments ranged from, "It was a very interesting experience--well worth the time" to "I responded



to some questions differently than I thought I would" to "It was boring and repetitious." Other comments were quite specific. One subject, for example, thought that the Follow-up Questionnaire needed revision. Two others commented on the sentence dyads: "Many sentences touched on what you might be feeling but didn't say exactly what you wanted it to"; "The stimulus sentences weren't effective in bringing the right reaction."

Several subjects commented specifically about the treatment they had received. Most of these unsolicited comments came from the CR group and were both positive and negative in tone.

A good point was that you should still be able to be happy if you fail or don't achieve your goal.

The counselor's use of words like 'nonsense' put me on the defensive--so I was not receptive to (his) advice.

The tape assumed that anxieties are a minor problem, overcome by a quick, simple method. It was an easy, cure-all type of message.

I don't care what other people think of me . . . I have goals for myself. I wouldn't go to see a counselor anyway.

I think this study helped me realize that my problems are problems because of my attitudes. I never thought about it in quite that way before. This is really food for thought.

Two other subjects, both in the VF group, commented about treatment. One simply stated that she didn't particularly like the experience. The other raised a significant ethical question, particularly relevant to implosive-type therapies: "Could the familiarity of a particular word being continuously flashed before you . . . make you flip-out if you have a real problem in that area?"



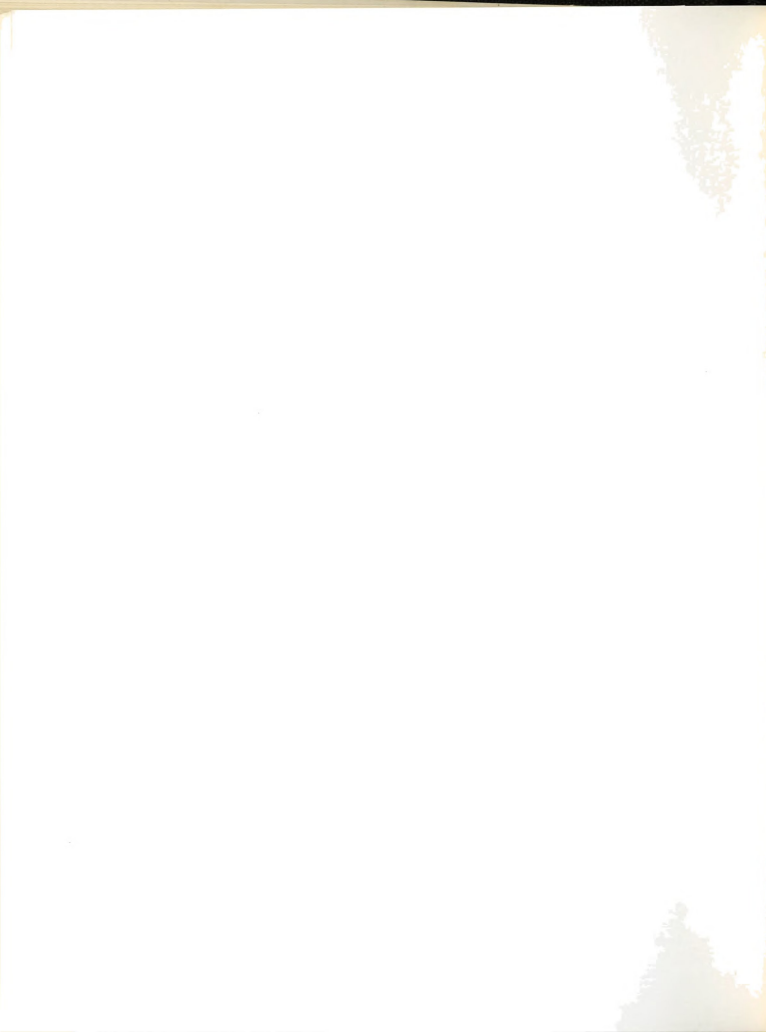
Summary of Results

Evidence was found to support Hypothesis 1--that subjects reading personal, emotion-laden statements would respond with greater physiological arousal than would subjects reading impersonal sentences of non-emotional content. The remaining Phase I hypotheses did not receive support. Accordingly, this experiment failed to replicate the positive findings of the Russell and Brandsma (1974) study.

The lack of support for the Phase I portion of the experiment precluded most of the proposed Phase II analysis. However, relevant Phase II cell means were reported, and several subsidiary analyses were performed and presented. All such analyses resulted in negative findings. In addition to these subsidiary analyses, three other hypotheses were also tested. Hypothesis 8 predicted post-treatment differences in subjective anxiety (defined as numerical ratings on the Coed Problem Checklist) between groups. No such differences were obtained.

The attempt to induce emotional arousal to low-relevant concerns was formally stated in Hypotheses 9 and 10. Hypothesis 9 predicted differences in physiological arousal between a negative semantic conditioning group and a control group, while Hypothesis 10 stated that subjective anxiety would differ between groups. Neither hypothesis was supported.

Finally, an analysis of the Follow-up Questionnaire was presented.



CHAPTER IV

DISCUSSION AND CONCLUSIONS

Overview

The purpose of this study was to examine three basic questions of both theoretical and practical import: (a) Is the classical conditioning model of rational emotive therapy (RET) posited by Russell and Brandsma (1974) an adequate one? If so, (b) are three analog treatments of language-conditioning techniques based on that model effective in reducing anxiety--emotional arousal? And (c) can anxiety be learned through strictly verbal conditioning procedures, as implied in the Russell and Brandsma model and as proposed by Staats (1972)?

To answer these questions, a two-phase, experimental plan was initiated. The first phase consisted of a replication of Russell and Brandsma's test of their model, while the second phase was designed to compare treatment effectiveness in reducing anxiety, as well as to investigate the acquisition process of maladaptive emotional responses.

Russell and Brandsma view RET from a classical conditioning perspective. Paraphrasing Ellis, they suggest that emotional arousal--feelings of pleasure, joy, anger, frustration, sadness, depression--basically involves a conditioned response to certain self-statements or thoughts. The fact that a person's thoughts serve as conditioned stimuli for affective states is rooted in the learning history of the individual. As certain words and phrases are paired with unconditioned



stimuli (e.g., physical pain or pleasure), they begin to acquire powerful conditioning properties. Eventually, the resulting emotive vocabulary comes to be used as a significant part of a person's internal dialogue. As that vocabulary is paired consistently with external and internal events (e.g., interpersonal situations or thoughts about interpersonal situations), the eliciting properties of these verbal stimuli are transferred to the event itself. Accordingly, previously neutral stimuli become conditioned stimuli which elicit conditioned emotional responses. These new conditioned stimuli are continuously strengthened by frequent pairings with the emotive vocabulary.

A clinically significant aspect of this chaining process is the person's lack of awareness of the ubiquitous existence of this emotive vocabulary or of its emotion-producing consequences. Thus, people react viscerally to apparently objective and non-emotive stimuli (to include verbal stimuli). They believe that certain events make them respond emotionally, seldom realizing the importance of the thoughts which accompany these events in producing emotion.

To test this model, Russell and Brandsma incorporated two independent variables into a within-subjects design. The degree of personal relevancy of a pair of statements (i.e., the extent to which a problem existed) served as one independent variable. If the problem was personally relevant--by definition, had frequently been paired with emotive, evaluative words--then an emotional response should result when the high-relevant statements were articulated by a subject. If, on the other hand, the problem was not personally relevant, that is, if, in the learning history of that person, emotive events or



words had not been paired with the statements of the problem, then emotional arousal should not be elicited as a result of their recitation.

The second independent variable, sentence-type, has already been alluded to above. The two levels of this second variable were (a) objective statements and (b) emotive, affect-laden conclusions about the objective statements. The interaction between these two variables predicted by the model should be clear: Emotional responses to objective factual statements will differ in accordance with the personal relevancy of the statement--high arousal to high-relevant, low to low--but will always be high to emotive, affect-laden statements, regardless of relevancy.

To manipulate these two variables, Russell and Brandsma developed a Coed Problem Rating List (problem relevancy) and pairs of statements--one objective and one emotive--related to each item on the rating list (sentence-type). The dependent variable was emotional arousal, as measured by galvanic skin resistance; the predicted interaction was obtained.

Phase I of the present study essentially replicated the Russell and Brandsma experiment. Fifty subjects, lower-division undergraduate females living in residence halls on the Michigan State University campus, spring term 1975, were randomly assigned to either a neutral sentence group (n=16) or an emotive sentence group (n=34). (Note: The neutral sentence subjects, included as controls, and necessary for a test of the first hypothesis, responded only to neutral sentences of an impersonal nature. That is, neither of the two independent



variables discussed above was exposed to the 16 neutral-sentence-group subjects.)

During the experimental session, each subject was attached to a polygraph machine and instructed to read aloud the sentence dyads presented to her via a slide projector. Four sentence dyads were exposed during Phase I. The first two were of neutral and impersonal content for all subjects and were not scored. For the neutral-sentence group, sentence dyads three and four (scored) were also of neutral and impersonal content, while emotive-sentence subjects read one high-relevant sentence dyad and one low-relevant sentence dyad (order alternated among subjects). The criterion variables involved physiological responsiveness as measured by the polygraph. Hypothesis 1, that affective verbal stimuli are more emotionally arousing than neutral verbal stimuli, was supported.

Hypotheses 2 and 3 involved the interaction between problem relevancy and sentence-type discussed above. Only the 34 emotive-sentence-group subjects were included in this repeated measures, multivariate analysis. The present study failed to obtain the positive support of these hypotheses found by Russell and Brandsma.

Phase II was intended to provide answers to questions involving treatment effectiveness and the acquisition of emotional arousal to neutral verbal stimuli. Thus, the 50 subjects were reassigned to five treatment groups. Three treatments were directed at reducing emotional arousal to the high-relevant verbal statements discussed in Phase I, while for one group the goal was the reverse, namely to create emotional arousal to verbal statements of low personal relevancy.

The three groups to reduce arousal were developed so as to approximate various language conditioning therapies. The cognitive restructuring (CR) group subjects listened to one of several tapes explaining the ABCs of RET and suggesting that certain self-statements needed to be changed as a means of controlling anxiety. The semantic desensitization (SMD) treatment goal was to alter the emotion-eliciting properties of certain words found in the objective statement of each subject's high-relevant problem by pairing these words with positively-valenced words--a counter-conditioning procedure. This treatment goal was identical for the verbal flooding (VF) group, although in the VF group the key words were paired with neutral words--an extinction procedure. Likewise, the attempt to induce emotional arousal in the negative semantic conditioning (NSC) group involved pairing certain low-relevant words with negatively-loaded words. The one remaining group was a no-treatment control group.

After experiencing an 11- to 15-minute treatment "package," each subject was asked to read sentence dyads in a manner identical to the Phase I instructions. Again the dyads involved pre-designated--from the Coed Problem Checklist--high- and low-relevant problems. During Phase II the dyads involved two high- and two low-relevant problems. The order was alternated among subjects.

It was intended that Phase II be tested by a repeated measures MANOVA with a design over subjects. The analysis was to involve planned comparisons between the five Phase II groups. However, it should be clear that tests of hypotheses concerning the effectiveness of the analog treatment groups are contingent upon positive Phase I



results. This is because a comparison of treatment effectiveness based upon anxiety reduction cannot be made if anxiety to the target stimuli (verbal statements about personally relevant concerns) does not exist. The negative results obtained in Phase I consequently render irrelevant the questions posed in Hypotheses 4 through 8.

A kind of performance anxiety may have affected subjects throughout the study and had the effect of obscuring the response differences to the various Phase I stimuli. If this is true, the question of whether the various treatments differ in their effectiveness in reducing performance anxiety might reasonably be posed. An analysis of this possibility, however, revealed no differences among the treatment groups. Furthermore, the three treatments were no more effective in reducing the hypothesized performance anxiety than was a no-treatment control group.

In addition, the analyses of the negative semantic conditioning hypotheses yielded nonsignificant results.

Thus, the answers to the three questions which formulated the basis of this study are: (a) The classical conditioning model of RET proposed by Russell and Brandsma was not supported. Consequently, (b) three analog treatments based on that model could not be compared as planned; however, they were no more effective than no-treatment in reducing hypothesized performance anxiety. And (c) emotional arousal was not conditioned by verbal conditioning procedures employed in the present experiment.



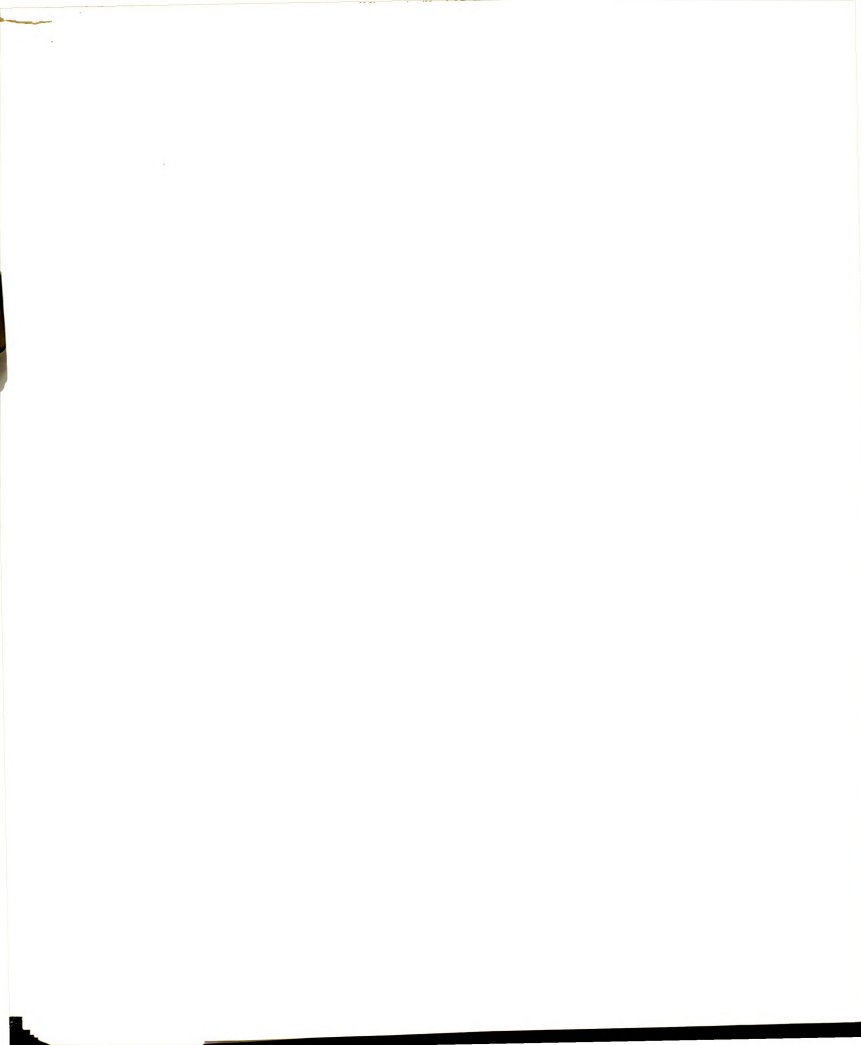
Discussion

Based on the results of this study, the model of RET elaborated by Russell and Brandsma appears to be inadequate. Quite simply, the importance given the role of conditioned verbal stimuli in controlling maladaptive emotional responses may be both oversimplified and overstated. Certainly, the differences in emotional responsiveness to a variety of self-statements required by the model were not obtained in this experiment. The implications for theory, and consequently for practice, are distressing.

On the other hand, these negative findings might be explained by one or all of a number of non-theoretical considerations. These include: sampling, instrumentation, procedures, and design and analysis. The purpose of this discussion section is to explore the adequacy of these explanations in accounting for the lack of positive findings. In addition, the adequacy of the theoretical basis of the study will be further considered. A distinction between Phase I and Phase II alternative explanations will be made where appropriate.

Sample

The constraints which a sample places upon the interpretation of data often involve external validity. In other words, because subjects in a given "sample" are not selected at random from a larger population, the results yielded by that sample may be unique and not representative of any population. In the present case, one might argue that the subjects, selected in non-random fashion, had unique characteristics which affected their responses. Additionally, it might be argued that the consequent non-significant results are atypical



and not generalizable to other populations. Although this possibility exists, it seems unlikely for two reasons. First, there is no evidence in the literature to suggest an interaction of the independent variables with any subject characteristic (see Campbell & Stanley, 1963, p. 19, for a general discussion of subject-by-treatment interaction). Second, Russell and Brandsma used a similar subject sample and obtained results in the opposite direction.

Another sample-related explanation of this study's negative results is that because subjects came from one of two dormitories, each participant knew at least several of the other participants in the experiment. Although subjects pledged not to talk to others about the study, it is conceivable that some discussed their experience with those who had not yet participated. If this was the case, subjects might not have been as candid in selecting high-relevant concerns from the Coed Problem Checklist. (Note: The argument presented here is appropos if subjects were not candid in their responses to the Coed Problem Checklist for any reason.) This would have effectively prevented the successful manipulation of the problem-relevancy variable. Accordingly, many subjects' so-called "high-relevant" problems would have had low personal relevancy, and differences in emotional arousal to the experimental stimuli would not be obtained. Although this contention seems believable, the mean ratings of high- and low-relevant items on the Coed Problem Checklist do not support it (see Table 2.2).

A more relevant sample-related hypothesis has already been raised in Chapter III, that is, that the entire experimental experience was an intimidating and anxiety-provoking one, resulting in a kind of



performance anxiety which washed out the relatively weak effects of the independent variables. The fact that Phase II treatments did not reduce this potential performance anxiety does not rule out its existence. The suggestion here is that the particular sample selected for this study was more vulnerable to performance anxiety than samples drawn from other populations might have been. Although this rationale also seems plausible, the fact that Russell and Brandsma obtained significant results with a similar population reduces its attractiveness as an alternative explanation for the present results.

One additional sample-related explanation concerns the "non-clinical" sample used in this study. It is likely that the anxiety responses found in the subjects included in this study are either less than or different from the anxiety responses of persons seeking psychological treatment for anxiety-related problems. One might expect, therefore, that differences in responses to intrapersonal concerns would vary between the two populations. That is, physiological responsivity between high- and low-relevant concerns might reflect greater discrepancy among "clinical" subjects than "non-clinical" subjects. On the other hand, the overall anxiety level of the clinical group might be such that responsivity to high- and low-relevant concerns would be minimally discrepant. In any event, this possibility may have a bearing on the present outcome, and it warrants further investigation. Once again, however, the Russell and Brandsma results cloud its plausibility.

Although the problem of obtaining physiologically different responses to high- and low-relevant concerns is a Phase I problem, the



above discussion is also appropriate to Phase II. Bernstein and Paul's (1971) comments concerning analog research with small animal phobics are particularly relevant. They emphasize the importance of using as subjects "only persons who can be shown to display significant and therefore clinically relevant increases in physiological arousal and cognitive distress (i.e., anxiety) as a result of the presence of the presumed eliciting stimulus object" (p. 228). This recommendation seems especially critical in research of emotional arousal by self-verbalization, because emotional arousal per se may not be clinically relevant. Ellis (1973b) notes that the emotions that result from irrational beliefs of worthlessness and depression differ from more adaptive feelings of disappointment, frustration, and annoyance. Because this difference cannot be detected physiologically it is difficult to determine whether physiological responsivity indicates adaptive or maladaptive emotion. Thus, when the efficacy of language treatment is investigated, future researchers should insure that only persons experiencing "clinically relevant" anxiety are included in attempts at reducing emotional arousal. Further, dependent measures which can distinguish neurotic anxiety from intense yet adaptive feelings to identical stimuli should be developed.

Instrumentation

If the instruments used to measure the dependent variables are (a) poorly conceived or (b) employed in a cavalier fashion, then resulting error variance may be sufficient to obscure significant differences



among the independent variables. The first issue is related to the validity of the instruments, while the second concerns reliability.

Two different dependent variables were used in this study: physiological anxiety, as measured by the degree of responsiveness of three physiological channels (employed in both phases), and subjective anxiety, defined as the rating of high-relevant problems identified on the Coed Problem Checklist (used only in Phase II). Evidence for the validity of the physiological variables as measures of emotional arousal was presented in Chapters I and II. Further, the fact that these dependent variables distinguished affective verbal stimuli from neutral verbal stimuli (Hypothesis 1) lends additional evidence to their validity as measures of emotional arousal. Although the validity of the Coed Problem Checklist as a measure of subjective anxiety was not directly established, an indication of criterion validity is found in Table 2.2.

In terms of reliability, the physiological variables were monitored in a consistently cautious and rigorous manner. The procedures outlined in Chapter II were religiously followed. Sufficient time was taken with each subject to insure that good, clear, scoreable records were obtained. Since most of the physiological variables were relative measures, it was important to insure that the subject was physiologically "quiet" before beginning each phase. Careful tracking of physiological activity before and between phases assured this necessary condition.

The reliability of ratings of high-relevant problems as a measure of subjective anxiety is less certain. One possible effect on reliability was the fact that subjects completed only 14 items of



the checklist at the end of the experiment, two of which included the previously selected high-relevant concerns. The fact that the subjective anxiety rating was given in the context of 14 items rather than the 98 pre-Phase I items may have increased its error variance.

Summarizing these factors, it is unlikely that poor validity and reliability affected the overall outcome of this study, although the instrumentation of subjective anxiety may have obscured differences among the treatment groups.

Before we leave instrumentation as a potential explanation of the present results, two other issues should be discussed. Both concern differences between the Russell and Brandsma study and the present one. First, the apparatus used to measure physiological arousal were not the same. Russell and Brandsma used a Gibson Model M5P polygraph, while a Grass Model 5D was employed in the present study. Although unlikely, variance in the sensitivity and precision of the two instruments may have yielded discrepant enough measurements to account for the dissimilar results. Related to the differences in apparatus are the differences in the physiological procedure. For example, Russell and Brandsma used a fingertip placement of electrodes, while in the present study electrodes were placed on the subject's palm. However, since both designs were within-subjects designs, and all group comparisons were made between subjects having similarly placed electrodes, differences in physiological procedure should not affect the respective outcomes of the two studies.

The second major discrepancy between the studies involves the use of different physiological variables. Russell and Brandsma's major



dependent variable was skin resistance, the reciprocal of skin conductance, which was used in the present study. Since, as noted in Chapter II, skin conductance bears a simpler and more linear relationship to the underlying processes of interest, it appears to be a more reliable and valid measure than does skin resistance. In addition, the log transformations required by skin resistance measures increase the likelihood of computational errors. These factors must be considered as a possible alternative explanation for the differences in results between the two studies.

Experimental Manipulations

If the independent variables are operationalized inadequately, the validity of an experiment can be questioned for two reasons. First, the dependent variables may not accurately reflect the manipulation of the intended independent variables. Consequently, the experiment will not accurately test the question it purports to investigate. Second, poorly developed independent variables introduce unexplained variation into the data which can obscure treatment differences. These issues will be discussed relative to problem-relevancy, sentence-type, and the various Phase II treatments. In addition, the possibility that the experimental procedures unrelated to the experimental manipulations (e.g., experimental setting) might have affected the outcome will also be considered.

Problem-relevancy. The Coed Problem Checklist, used to manipulate problem-relevancy, was discussed in Chapter II. The checklist was originally devised by Russell and Brandsma, and only minor



variations of the checklist were made for the present study. These differences are also described in Chapter II, and they are so minor it seems highly unlikely that they could have affected the outcome of this replication.

It was noted in Chapter II that if the checklist discriminated poorly between high- and low-relevant problems, then the degree of concern between these two types of stimuli would not be meaningful. In other words, subjects would be responding to so-called high-relevant problems whose content was really of little concern to them. However, evidence was presented (Table 2.2) indicating that the participants themselves evaluated the checklist as having included one of their most significant concerns. To further investigate this possibility, the mean ratings--on a scale of 1 to 7--of low- and high-relevant concerns for all subjects were computed; they are 1.00 and 6.12, respectively. The relative degree of concern expressed toward these two kinds of verbal stimuli suggests that the dimension of relevancy was manipulated successfully. Further, these mean ratings compare favorably to those obtained by Russell and Brandsma (1.06 for low-relevance and 6.78 for high-relevance).

Sentence-type. The sentence-type variable required a translation of the Coed Problem Checklist items into two related statements about the checklist item. The first statement was intended to be objective and factual, while the second was structured to include negative, emotional words in drawing a conclusion about the first sentence. An illustration of this sequence will help to clarify it.



Coed Problem Checklist item:

I feel there is too much emphasis and pressure on grades.

Experimental stimuli based on Coed Problem Checklist item:

Sentence A: My parents have told me they want good grades . . .
I have to keep at least a 2.0 standing to stay in college.

Sentence B. There's too much pressure for grades . . . all the stress is horrible. I can't stand it . . . I feel so anxious . . . I'm a nervous wreck.

It is obvious from this example that in translating the checklist item, an interpretation of the item was required. In this case, the sentence dyad assumes that the respondent feels academic pressure from her parents. Although this is a reasonable interpretation given the context of this response, it is, of course, not the only interpretation. Instead, a person might feel that the pressure on grades is needlessly self-imposed, or comes from certain professors, from friends in the dormitory, or even from the general college atmosphere. If this were the case, the subject would be reading an irrelevant, type-A sentence which had been identified by the experimental procedure as high-relevant. Accordingly, the dependent variables could not be expected to differentiate problem-relevancy.

The above example was included to illustrate this point because it is, in fact, what happened to one subject. She volunteered that her concern about academic pressure was based on college atmosphere and added that her parents had never pressured her about grades. Since information about the interpretation accuracy of checklist items was not systematically solicited from all subjects, it is impossible to assess the effects of inaccurate interpretations on the outcome of the



study. However, several subjects, perhaps four, volunteered similar comments. A comparison of the Coed Problem Checklist (Appendix A) with the sentence dyads (Appendix D) indicates that many other items are vulnerable to misinterpretation. Thus, inaccurately interpreted experimental stimuli might have been presented to enough subjects to affect the results of this study.

Related to this interpretation hypothesis are two other factors which may have affected responses to the experimental stimuli. First, the words used to express some highly relevant problems may have diminished emotional arousal while retaining the appropriate content and interpretation. For example, one subject who expressed concern about sexual behavior stated that the word "boys" in the stimulus sentence did not have the impact "men" would have had. If an inappropriate word reduced the emotional valence of a stimulus sentence for a significant minority of subjects, the outcome could have been affected.

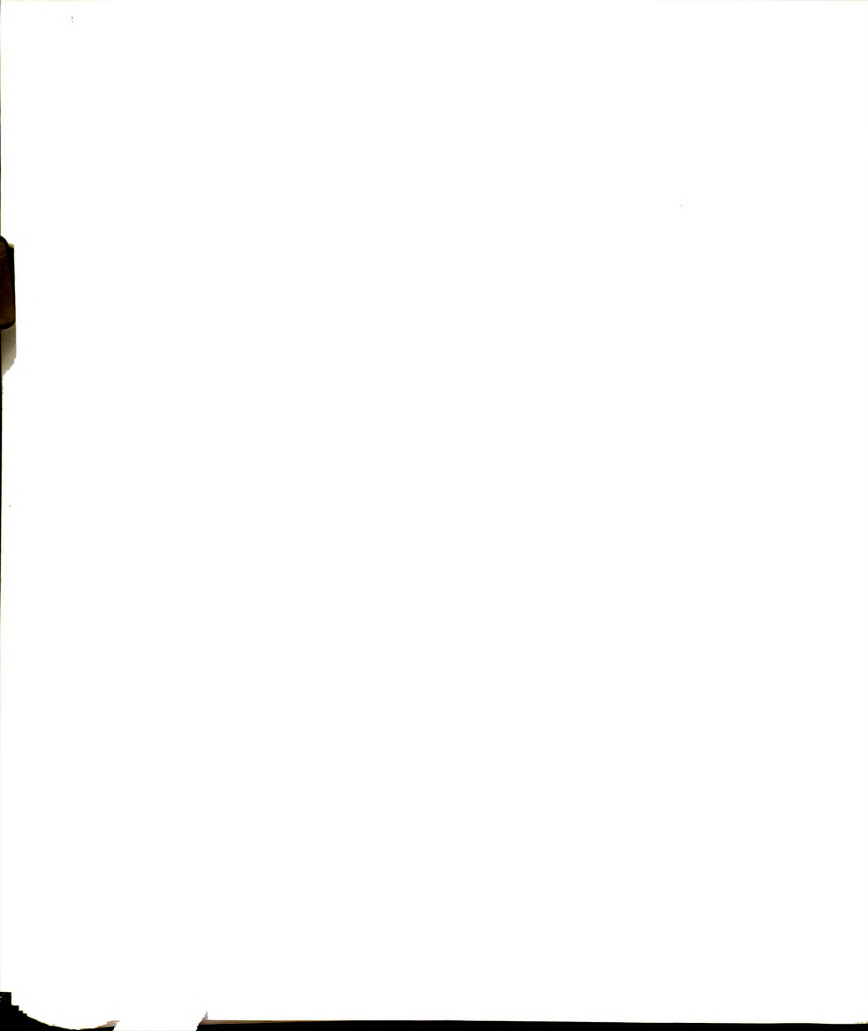
Second, concerns listed as low-relevant might have employed words which have a great deal of emotive impact. For example, six subjects listed sexual-behavior-related concerns as the concern of lowest personal relevance to them. Unfortunately, only three of these subjects were in the emotive-sentence group during Phase I; the others read neutral sentences. However, the three emotive-sentence-group subjects read words such as "sexual intercourse" as part of sentence A of their low-relevant concern. It might be hypothesized that stating the words "sexual intercourse" in such a situation would elicit emotional arousal (Cohen, Silverman, & Burch, 1956, obtained just such results; subjects' GSRs were larger to sex-related verbal



stimuli). In fact, in the present study, the mean SCR of these three subjects to the Phase I, low-relevant, type-A sentence was 10.01, while for all emotive group subjects it was 3.56 (Table 3.6). These data lend credence to the possibility that some low-relevant items contained "high-relevancy" words or phrases. Given the small number of subjects involved in this hypothesis, it is unrealistic to test it formally. Nevertheless, it suggests that low-relevant concerns were not really of low-relevance for some subjects. The present findings might be questioned on that basis; however, which checklist items and accompanying sentence dyads might elicit emotional arousal, regardless of personal relevancy to the respondents, is an empirical question which this study was not designed to answer.

Summarizing this discussion of the sentence-type variable, three problems were noted: (a) misinterpretation of Coed Problem Checklist items, (b) decrease of emotional arousal because of certain words in the high-relevant stimuli, and (c) increase of emotional arousal because of certain words in the low-relevant stimuli. These factors suggest that the independent variable of sentence-type was poorly manipulated. It must be noted, however, that Russell and Brandsma obtained significant differences using similar stimuli.

Phase II treatments. The lack of significant Phase II results--Hypothesis 4 through 8--is more a function of the initial, Phase I, failure to obtain the emotional arousal to the experimental stimuli which the treatments were designed to reduce, than a consequence of the treatment packages themselves. Regardless of the reasons for the results, however, the treatments might not be powerful enough to



effect differences when employed in a one-shot, intra-session fashion. This possibility is certainly relevant to the Phase II treatments. Yet, as noted in Chapter I, several supportive studies of RET are based upon taped treatment "lectures" administered in only one session (e.g., Burkhead, 1970). Moreover, Ellis himself frequently demonstrates RET principles at workshops by doing one-time-only therapy with a volunteer client. In addition, two of Hekmat's (1972; Hekmat & Vanian, 1971) semantic desensitization studies are designed to take place in one session. In fact, in both studies, treatments were not only administered in one session, they were administered to groups. Given the positive results obtained in these studies, the present use of a single-session treatment should not, ipso facto, yield negative results.

A related issue is the degree of representativeness of these analog treatments of cognitive behavior modification language conditioning techniques. Certainly, even if the Phase II results can be construed as negative in any meaningful sense, the implications, particularly for cognitive restructuring, are limited. The CR procedure in the present study was only analogous to CR-like clinical treatments. Thus, as a less than "perfect" analog, results which might be meaningful can be generalized to other CR treatments only insofar as the present procedure captures the key ingredients of cognitive restructuring. To what extent these ingredients are "captured" can be judged by the reader (see Bernstein & Paul, 1971, for a discussion of the generalizability of analog treatments).

Hypotheses 9 and 10 were not contingent upon Phase I results. The lack of support obtained for these hypotheses is puzzling. Most of the alternative explanations related to sampling seem as unreasonable for these hypotheses as they are for the others. In addition, the most plausible of the sampling-related explanations is irrelevant to Hypotheses 9 and 10 because it does not require a "clinical" sample. The instrumentation of the dependent variables also seems an inadequate explanation. Inasmuch as the mean rating for low-relevant concerns was 1.00 (on a scale of 1 to 7), the problem-relevancy variable can be viewed as successfully manipulated. Further, since the important dependent variable was responsiveness to only one sentence stimulus, the sentence-type variable is irrelevant. One possibility appears to be that if emotional arousal was induced to the key word of the low-relevant problem, it did not generalize to the full problem statement.

Procedures. It was suggested in Chapter II that performance anxiety may have been experienced by subjects as the result of nuisance variables inherent in the experimental situation. For example, the setting of the experiment, the visibility of the physiological apparatus, and the male graduate student who subjects were aware was monitoring their responses to experimental stimuli all could have helped create some kind of experimental or performance anxiety. These extraneous experimental factors may have increased anxiety to a level which obscured differential responses to the various experimental stimuli. This hypothesis is impossible to investigate at this point,



but it does seem reasonable that it might have been a contributing factor in the negative outcome.

Another procedural possibility is that the act of reading a sentence aloud--regardless of relevancy and appropriateness of content--may very poorly approximate the thoughts it is intended to represent. Consequently, responses to sentences would not approximate responses to thoughts. Certainly, the chain of stimuli typically leading to negative self-verbalizations were absent in the laboratory situation. As such, the artificiality of simply presenting sentences and having subjects read them aloud may have been a poor representation of self-verbalizations and resulted in attenuated emotional responding. Again, however, the Russell and Brandsma results, as well as Rimm and Litvak's (1969) and Velten's (1968) studies, argue against this possibility.

Design and Analysis

Lack of statistical significance can frequently be attributed to an improperly designed experiment or to inappropriate analysis of the data. The design and analysis in this study appear to have been both properly and appropriately employed. To conform to the recommendations for psychophysiological research, both Phases I and II involved with-subjects factors, although between-subjects factors were also included in the two phases. The repeated measures MANOVA was appropriate, since all levels of the within-subjects factors were administered to each subject, and multiple dependent variables were used throughout. Additionally, as a means of including the one nuisance variable in the study, the order of administering sentence dyads was incorporated into the design.

Recall from Chapter I that Russell and Brandsma can be criticized for their design and analysis because a multivariate analysis of their data might have been more appropriate. The consequences of their ignoring two non-significant dependent variables was discussed in Chapter I. A repeated measures approach could also have strengthened their design by taking into account intercorrelation among responses to the within-subjects factors (problem relevancy and sentence type). Although the Phase I portion of this experiment was intended to rectify these methodological "flaws," it must be reiterated that the approach to the data taken by Russell and Brandsma was also a reasonable one. In addition, note that one improvement--the use of multivariate analysis--is in a "conservative" direction (more difficult to obtain differences than separate analysis of each variable), while the other--the repeated measures approach--"liberalizes" the probability of finding differences among the independent variables by accounting for the intercorrelations among the responses at the several data points.

In any event, it might be profitable to compare the results of the two studies in a multivariate fashion. The multivariate approach attends to the data as a whole and assumes that a number of dependent variables are related to one another in a conceptually meaningful way. If they are, and if analysis of each of the measures is performed separately, i.e., if a multivariate approach is not taken, then redundancy in the results will be expected, to the extent that the measures overlap (are non-independent). As a consequence, statistical error rate may be multiplied many times over and associated null hypotheses



falsely rejected. In other words, the probability of making Type I errors is increased considerably, as appears to be the case in the Russell and Brandsma study.

To avoid this problem, Hummel and Sligo (1971) suggest the use of a multivariate criterion for the global test. Then, if the null is rejected, univariate F statistics may be inspected or tested individually to determine which variables have important group-mean differences and contribute the most to the overall significant MANOVA. (This was the approach taken in the present study.) They add that any testing of univariate F s within a multivariate scheme must include a partitioning of the overall statistical error rate among the various univariate F tests. The effect will be to keep the probability of making a Type I error at an acceptable level.

Had Russell and Brandsma taken such an approach, the appropriate univariate significance level, when partitioned among the three dependent variables, would have been $p < .01$ and only one hypothesis (besides Hypothesis 1) would have received skin resistance support: the main effect for problem relevancy. From this perspective, the interaction hypothesis, which is the focal point of the model, fails to be supported (although the SR variable approaches significance with $p < .05$).

Viewed in this context, the results of the present experiment closely parallel those obtained by Russell and Brandsma. Hypothesis 1 received support in both studies. Hypothesis 2 was accepted in Russell and Brandsma's study and received tentative support--one significant univariate F --in this experiment, while significance was not



obtained for the interaction effect, Hypothesis 3, in either investigation.

Because it is impossible to determine the multivariate results Russell and Brandsma would have obtained, this analysis of their data must be viewed as highly speculative. Yet, it is an interesting speculation, and it raises the possibility that the non-theoretical explanations of the negative results of the present study are also applicable to Russell and Brandsma's.

Theory

One possible explanation for the negative outcome might be that the model upon which this study is based is an inadequate one, and the validity of Russell and Brandsma's theoretical formulations is questionable. A consideration of this possibility is presented below. Inasmuch as the Phase II portion of the study is based on both the assumptions and the classical conditioning framework of the model, this discussion should be viewed as relevant to both phases.

The basic assumptions of the model parallel those of CBM. Extensive support for these assumptions was presented in Chapter I, suggesting that the basis for Russell and Brandsma's model and the present extension of that model appears to be theoretically sound.

Russell and Brandsma have conceptualized RET within an apparently accurate classical conditioning framework. In learning terms, they predict that (a) two different types of conditioned emotional stimuli--high-relevant sentence dyads--will each elicit a conditioned emotional responses. Further, they assert that (b) a neutral stimulus will elicit no response, and a conditioned emotional stimulus--low-relevant



sentence dyad--will elicit a conditioned emotional response. Theoretically, this is a straightforward and simplistic formulation.

It may be too simple a model of the cognitive processes with which the language techniques are concerned, however. Russell and Brandsma appear to make two assumptions which exceed those of CBM. First, they assume that the learning processes which govern cognitive events are identical to those of overt behavior. That is, principles of operant and classical conditioning can be extrapolated directly from overt to covert behavior. Although this assumption enjoys some clinical support, analogy, rather than empirical evidence, appears to be its base. Research directly and indirectly testing this assumption (e.g., Johnson & Elson, 1974), as well as evidence from attribution theory and Schacter's (Singer & Schacter, 1962) theory of emotion (briefly reviewed in Chapter I), indicates that a broader conceptualization of cognitive processes is needed. In addition, recent research obscuring the differences between instrumental and classical conditioning (Miller, 1969) and exposing some of the constraints on learning (Shettleworth, 1972, pp. 1-62) suggests that overt learning principles once thought inviolable are being modified. Insofar as general laws of learning are being questioned, the adequacy of direct cognitive extrapolations would also be suspect.

A second related assumption made by Russell and Brandsma is that a neutral stimulus presented contiguously with a conditioned stimulus will automatically result in classical conditioning. Again, the attribution and belief literature (see Chapter I) suggests that a



stimulus contiguity is not the only operative factor in cognitive conditioning.

One other point relative to the Russell and Brandsma model can be made. First, it might be necessary to include imagery in any model of cognitive behavior. Although Russell and Brandsma do not specifically exclude imagery, their focus is upon the verbal aspects of cognition. As noted in Chapter I, language techniques can provide powerful clinical tools, and the relative contributions of both language and imagery to the modification of cognitive behavior are an important research topic. However, any "example" of cognitive process may require imagery as an integral part of its conceptualization. Consequently, tests of models which do not include it might yield results confounded by its absence.

In summary, the classical conditioning model of RET may be accurate but incomplete. The cognitive processes with which language treatments such as RET are concerned may involve more complex verbal and imaginal systems than the Russell and Brandsma model posits: thus, the equivocal outcome of this study.

Summary

The failure to achieve statistical significance for the majority of the present hypotheses was examined in the light of sampling, instrumentation, experimental manipulations, design and analysis, and theoretical considerations. Several potential theoretical inadequacies in the Russell and Brandsma model were discussed. That these inadequacies may account for the present negative results is a possibility. However, because the model was seen to be more incomplete than inaccurate,

extensions of the model may provide a heuristic and useful example of the cognitive aspects of emotional arousal.

Non-theoretical possibilities for the results were also explored. The most probable explanations appear to be: (a) the use of a "nonclinical" sample and (b) the poor operationalization of one of the independent variables--sentence-type.

Conclusions

In conclusion, the rationale for this study had three major elements: (a) the burgeoning interest in the general area of cognitive behavior modification (CBM), coupled with the lack of research support for the clinical uses of many CBM techniques; (b) a recently proposed model of one CBM technique (RET) focusing on the language aspects of cognitive behavior; and (c) the resulting need for a test of a potentially useful CBM model, as well as for clinical analog treatments based on that model. Fundamentally, this was a study of a uniquely human attribute--self-talk. The negative results do not alter the fact that individuals talk to themselves. To what extent this talk affects emotion and how this talk might be best used to alleviate maladaptive emotion remains to be seen.

The fact that the results of the present study are largely negative should not discourage future research based on the Russell and Brandsma model of RET. The model remains a potentially useful starting point for investigating the acquisition, maintenance, and reduction of maladaptive and unsatisfactory emotional responses. Future researchers, however, should consider several methodological variations of the present study: (a) solicit subjects who have "clinically"



relevant (serious) problems; (b) insure that the possibility of communication about the experiment is minimal; (c) administer the problem checklist several days before the experiment; (d) at that time, solicit information about the concerns designated as high- and low-relevant, and construct sentence dyads based on that information (i.e., individually tailor sentence dyads for each subject); (e) include in the experimental stimuli only those low-relevant concerns which are not likely to have emotive impact; (f) use an experimental setting conducive to relaxation (g) give instructions which will clearly motivate subjects to read sentences as if they were actually thinking them; (h) individually package all treatments, find out more about the high-relevant concern--and its potential irrational assumptions--for each subject, and also identify for each subject both positively- and negatively-valenced words which could serve as conditioned stimuli in the semantic-desensitization- and verbal-flooding-type treatments; and, finally, (i) devise a means of collecting subjective reports of anxiety after each stimulus presentation.



APPENDIX A

MONEY-RAISING PROJECT

APPENDIX A

MONEY-RAISING PROJECT

I need freshman and sophomore women to participate in a psychology research project. Approximately one hour of each woman's time will be needed sometime between May 14 and May 29 (scheduling flexible). The project involves a comparison of three counseling approaches, and I will be requesting feedback from each participant.

Subjects will be monitored by a polygraph during part of the hour. (All data collected in this project will be kept confidential.)

Houses interested in participating will be paid according to the following schedule:

1st 15 women--\$20.00

2nd 10 women--\$20.00

\$2.00 for each subject over 25

Houses with 25 subjects or more will receive a \$10.00 bonus.
(Houses may join up to get the bonus.)

House representatives of houses willing to participate should call:

STEVE ELSON 394-1645



APPENDIX B

COED PROBLEM CHECKLIST



APPENDIX B

COED PROBLEM CHECKLIST

Subject Number _____

Age _____

Class _____

Instructions:

This is a list of problems which are frequently encountered by girls attending large universities. The list includes problems in three main areas: personal, academic, and family-parental. You are to read through the list and rate each item on a scale of 1 to 7.

If an item is not a problem for you and never causes you any concern or worry, rate that item with a 1. If an item is one of your major problems and causes you a great deal of worry and concern, rate that item with a 7. Other items which fall between these extremes should be given intermediate ratings. For example, if an item is sometimes a problem causing you worry but at other times is not a problem that you are concerned about, you should give that item a rating of 4. Feel free to use all of the numbers from 1 to 7 to indicate the seriousness of these problems as they apply to you at the present time. (See the key below.)

Specifically, you are to take the following three steps:

- I. Read the list slowly, pausing at each item, and rate each one on a scale of 1 to 7, according to its seriousness as a problem area for you. Place your rating in the blank to the left of each item.
- II. (a) After you are through with rating all of the items, review your ratings and pick out the two items which are your most serious problem areas and cause you the greatest amount of concern and worry. These two items should be selected from those which have received your highest ratings. Write the number of these items and their ratings in the blanks at the end of the list.

(b) Each problem statement contains one or more underlined words. From these underlined words, select what you consider to be the key word(s)--most representative of the problem--in the two items identified in (a). Write these words beside the ratings.



- III. (a) Follow the same procedure as in IIa, but this time pick out the two items which cause you the very least amount of concern or worry and are never problems for you. These two items should be selected from those which have received your lowest ratings. Write the number of these items and their ratings in the blanks provided at the end of the list.
- (b) Follow the same procedure as in IIb, but select the key word(s) from the two items identified in IIIa.



Part I

Key

- 1 = not a problem--never even crosses my mind
 2 = very minor problem--not really concerned about it
 3 = minor problem--seldom feel concerned about it
 4 = sometimes a problem--occasionally feel concerned about it
 5 = somewhat significant problem--think about it fairly often
 6 = significant problem--frequently experience concern about it
 7 = a very significant problem which causes much worry and concern

- ___ 1. My parents pressure me too much to have an active social life.
- ___ 2. I worry about getting enough dates.
- ___ 3. I feel so discouraged about my grades I may quit college.
- ___ 4. I have trouble with my psychology course.
- ___ 5. I feel insecure around people, even my friends.
- ___ 6. My parents do not want me to come home very often.
- ___ 7. I do not know how to study in college.
- ___ 8. I worry about being liked by dates.
- ___ 9. I worry about maintaining grades to keep a scholarship.
- ___ 10. I criticize other people too much.
- ___ 11. My parents will not allow me to be independent.
- ___ 12. I am shocked by other girls' sexual/drinking behavior.
- ___ 13. I do not feel like I am really being myself.
- ___ 14. I am embarrassed by public speaking, even just expressing my ideas in class.
- ___ 15. I have trouble with my English course.
- ___ 16. I miss my parents while I am at college.
- ___ 17. I am in conflict over continuing to date an old boyfriend.
- ___ 18. I feel there is too much emphasis and pressure on grades.
- ___ 19. I am in conflict over having sex.



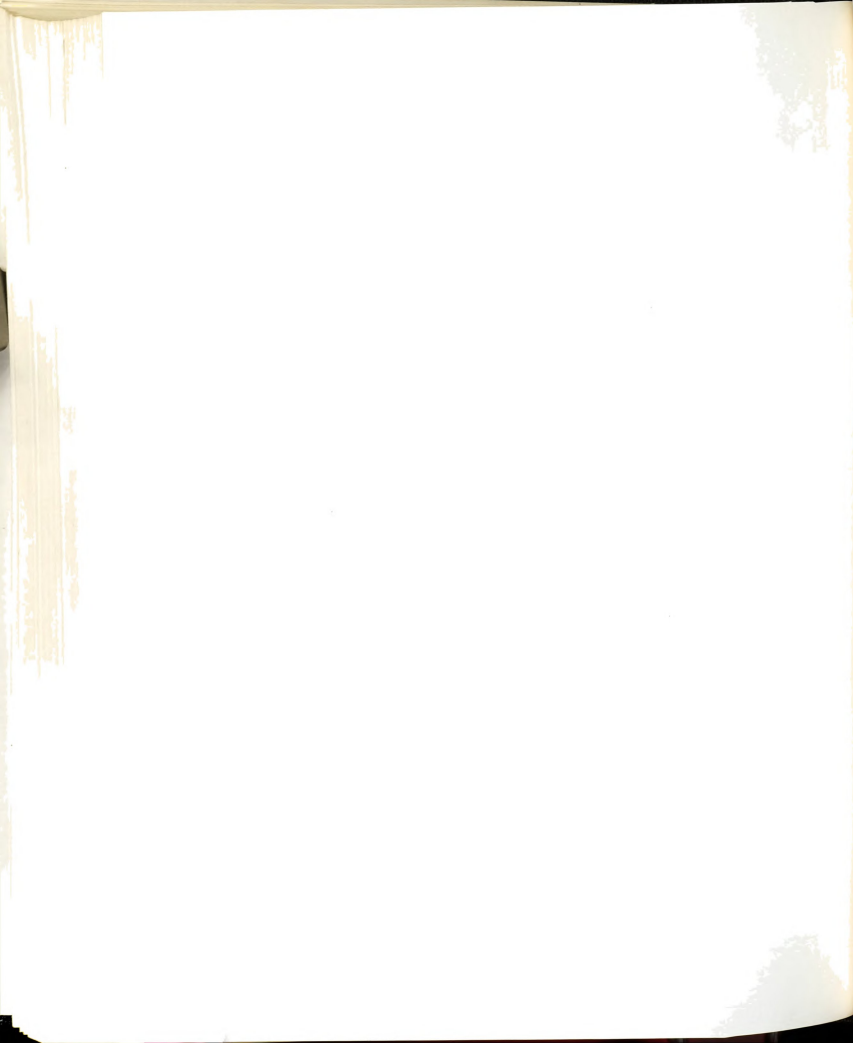
- ___20. I am afraid my parents will find out that I have been drinking.
- ___21. I cannot get along with my sister.
- ___22. I feel dumb because friends make better grades than I do.
- ___23. I am afraid of disappointing my parents with my grades.
- ___24. My parents are always losing their tempers.
- ___25. My grades are not up to my own academic standards.
- ___26. I cannot relate to other girls who do not share my moral standards.
- ___27. My morals/beliefs are different from my parents'.
- ___28. My parents emphasize grades too much.
- ___29. I am bothered by feelings of inferiority.
- ___30. My parents pressured me too much to go to college.
- ___31. I find it difficult to study in the dorm.
- ___32. I worry about getting pregnant.
- ___33. Boys put too much pressure on me for sex.
- ___34. My parents do not get along with each other.
- ___35. My parents act as if I am untrustworthy.
- ___36. I am always being compared unfavorably with my brother.
- ___37. Big lecture classes are a problem for me.
- ___38. I do things that are morally wrong to please the crowd I am with.
- ___39. I worry too much about tests.
- ___40. I worry about choosing a husband for the rest of my life.
- ___41. I worry about how far to go sexually with boys.
- ___42. I do not have anyone in my family to talk to.
- ___43. My parents do not understand the pressures and problems of college.



- ___44. Having to work and go to college at the same time is too much for me.
- ___45. I cannot talk to boys when I first meet them.
- ___46. I am unable to form a love relationship with a boy.
- ___47. I worry about my poor class attendance.
- ___48. My parents do not like my friends.
- ___49. I have a lack of motivation to study.
- ___50. I am afraid of being ridiculed by boys.
- ___51. I do not have any dates because boys treat me like one of the guys.
- ___52. My parents do not like my present boyfriend.
- ___53. I cannot get along with my brother.
- ___54. My parents are too strict with me.
- ___55. I am drifting away from God and my religion.
- ___56. My grades are not as good as they were in high school.
- ___57. I have conflict with my parents over money.
- ___58. I am always taking things too seriously; I'm definitely overly serious.
- ___59. I view college as more important than it really is.
- ___60. I feel ashamed of my lower-class background.
- ___61. I spend too much time with other girls.
- ___62. I worry about whether I should get married or finish college.
- ___63. I am timid and socially backward around boys.
- ___64. I cannot share very personal and deep feelings.
- ___65. I have almost no social life on campus.
- ___66. I get too upset when people hurt my feelings.
- ___67. I am afraid to do things because my parents might disapprove.
- ___68. I have trouble with my chemistry course.



- ___69. I am afraid other people do not like me.
- ___70. I do not show enough appreciation to my parents.
- ___71. I do not fit in with the crowd because I do not drink.
- ___72. I do not know if I want to be independent of my parents.
- ___73. I cannot decide on a definite major.
- ___74. I worry about getting the right courses for graduation.
- ___75. I do not have enough time to study.
- ___76. Physical contact with boys scares me.
- ___77. I feel self-conscious about the fact that I am overweight.
- ___78. My college courses are irrelevant to life.
- ___79. Other girls are jealous of me.
- ___80. I have trouble and worry about finding an advisor.
- ___81. I am unsure if I am really in love.
- ___82. I have only one parent.
- ___83. I am extremely disappointed because I did not get in a sorority.
- ___84. People are offended by my sense of humor.
- ___85. My parents will not approve if I quit college.
- ___86. I do not like a particular professor or instructor.
- ___87. I have too much reading to do.
- ___88. I worry about whether to date one boy or several.
- ___89. I am too self-centered.
- ___90. I am always being compared unfavorably with my sister.
- ___91. I cannot assert my independence from my parents.
- ___92. I feel self-conscious about my appearance.
- ___93. I am occupied too much by socializing and a party-like style of life.



- ___94. I worry about getting caught cheating on exams.
- ___95. I feel out-of-place in social situations.
- ___96. I worry about one of my parents' health.
- ___97. I have trouble with my math/science courses.
- ___98. I feel my parents do not love me.

Part II. List your two most important and serious problems and identify the word(s) which represent them.

1. Item number___ Rating___ Representative word(s)___
2. Item number___ Rating___ Representative word(s)___

Part III. List the problem areas which are least important and serious for you and identify the word(s) which represent them.

1. Item number___ Rating___ Representative word(s)___
2. Item number___ Rating___ Representative word(s)___

APPENDIX C

FOLLOW-UP QUESTIONNAIRE

APPENDIX C

FOLLOW-UP QUESTIONNAIRE

1. Did the problem checklist include the problem which concerns you most right now? Yes _____ No _____
If no, how would you rank the problem to which you gave the highest rating relative to the problem which actually concerns you the most?
2nd most important _____ 4th most important _____
3rd most important _____ Other _____
2. Using the problem checklist key, is there any problem you have which you would rank as a 7? _____ 6? _____ 5? _____
3. In the sentence pairs that were presented to you via the slide projector (the ones keyed to the problem checklist), consider the first sentence A and the second sentence B.
 - a. Have you ever thought such phrases as those contained in the B portion of the sentence pairs?
Yes, frequently _____ Not aware of it _____
Yes, occasionally _____ No _____
 - b. Have you ever thought those kinds of thoughts about other problems?
Yes, frequently _____ Not aware of it _____
Yes, occasionally _____ No _____
4. In your opinion, how were the stimulus sentences to have affected you:
respiration rate
heart rate
galvanic skin response
5. What do you think was the goal of the treatment you received?
6. If you have a personal problem with which you wanted help, would you choose a counselor whose approach is similar to the one to which you were exposed today?
Yes _____ Probably not _____
Probably _____ No _____
Why?
Why not?
7. Any additional comments you have would be appreciated.



APPENDIX D

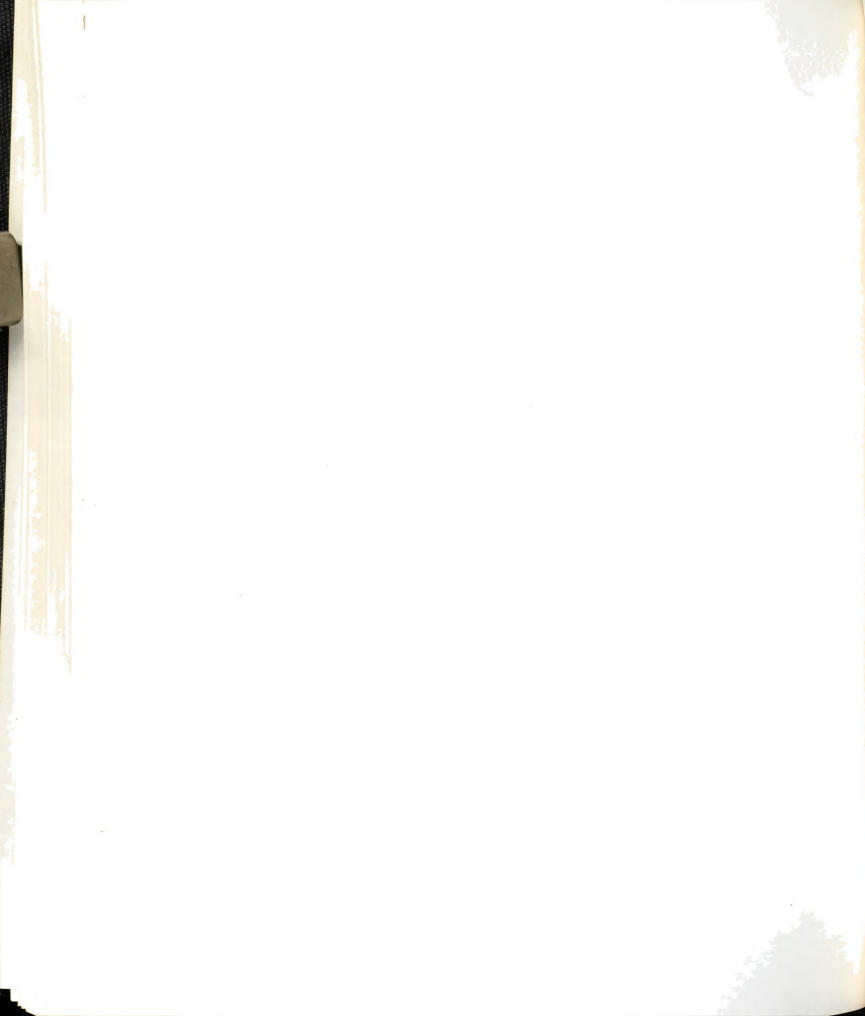
DYADS OF STIMULI

APPENDIX D

DYADS OF STIMULI

Note: The numbers of these dyads correspond to the items on the Coed Problem Checklist.

1. A. My parents have often expressed their desire for me to engage in as many extra-curricular activities as I can.
B. My parents are too pushy, it's awful . . . socializing is so phony . . . their constant prodding is making me sick and miserable.
2. A. Compared to other girls I know, boys don't call me very often, and I don't have many dates.
B. I don't have enough dates . . . there must be something wrong with me . . . I feel so unwanted and depressed.
3. A. College demands ability plus much studying to graduate . . . my grades are not very high.
B. College is hopeless . . . I'll never do well . . . I'm so depressed and miserable, I may quit.
4. A. I find that my psychology textbook and lectures are quite difficult.
B. I can't understand psychology, it's awful . . . I just know I'm going to fail . . . I get so confused and upset.
5. A. People I know, even my friends, very rarely come right out and say that they like me or approve of me.
B. Something dreadful is wrong with me . . . people make me so insecure, it's awful . . . I get so nervous and uncomfortable.
6. A. My parents prefer that I remain at school instead of going home on weekends and during some of the holidays.
B. My parents don't want me or love me, it's awful . . . I feel like a homeless nothing.
7. A. I put in a lot of time and effort studying, but my test grades are not very high.
B. My study habits are terrible . . . I'll never learn to study, it's hopeless . . . I get so depressed, I'll probably flunk out.
8. A. At times I have been with a date who did not tell me he liked me.
B. My dates don't like me . . . no one will ever love me . . . I feel so worthless and unloved.



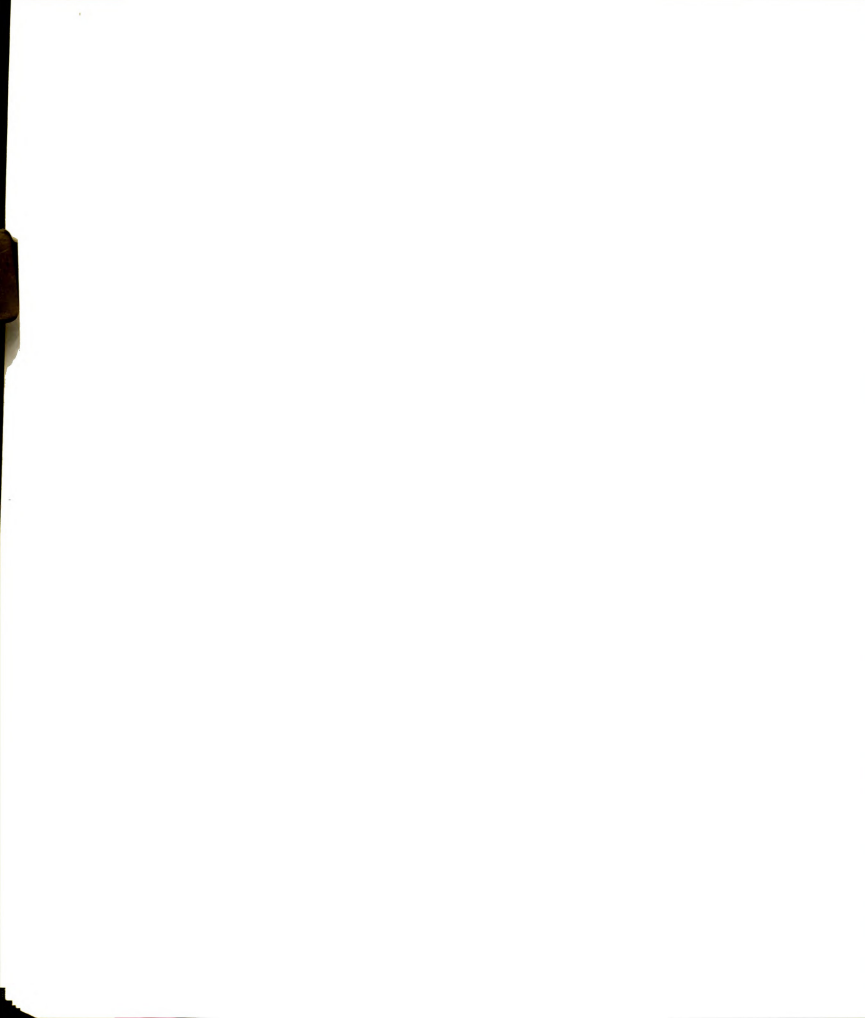
9. A. A scholarship requires that a student maintain a certain grade point average or lose the scholarship to someone else.
B. Classes are too hard . . . I know I'll lose my scholarship . . . I get so anxious and worried about it.
10. A. I often say exactly what I think to people, even if it is a criticism which they don't want to hear.
B. I am much too critical . . . I'm horrible, no one will ever like me . . . I feel like such a hateful, grouchy person.
11. A. I am not independent of my parents, because they frequently tell me what to do, and I usually end up following their wishes.
B. My parents are dictators . . . being bossed is terrible . . . they make me so mad, I hate them.
12. A. Some girls I know frequently drink alcoholic beverages and indulge in sexual intercourse . . . their standards are different from mine.
B. Promiscuous behavior is immoral and shocking . . . it's awful that they're such sluts . . . being around them makes me sick and upset.
13. A. Sometimes instead of doing what I want to do and just being myself, I play a role to please my friends.
B. I'm not honest with myself . . . I'll never be my true self . . . I'm such a phony, I hate myself.
14. A. Public speaking, including having my instructor call on me to answer a question or give an opinion, is difficult for me.
B. I just can't talk in front of people . . . I always say stupid things, it's so embarrassing . . . I feel so awkward and inadequate.
15. A. I find that understanding lectures in English class and taking notes or writing on an English assignment is not easy for me.
B. I can't succeed in English . . . it's awful, I just know I'm going to fail . . . I get so confused and upset.
16. A. It is necessary for me to be away from my parents most of the year while I am attending college.
B. I need my parents desperately . . . I'm so homesick I could die, it's dreadful . . . I'm so alone and miserable being away from home.
17. A. I have had one boyfriend for a long time, but I no longer wish to date him.
B. What if I never find another boy friend . . . that would be terrible . . . I feel so confused and miserable.



18. A. My parents have told me they want good grades . . . I have to keep at least a 2.0 standing to stay in college.
- B. There's too much pressure for grades . . . all the stress is horrible, I can't stand it . . . I feel so anxious, I'm a nervous wreck.
19. A. A boy that I date wants me to have sexual intercourse with him and I am wondering what to tell him.
- B. There is only one correct decision . . . deciding on my sexual behavior is so upsetting . . . it makes me so guilty, confused, and disturbed.
20. A. I can remember situations when I have done too much drinking . . . I frequently drink alcoholic beverages.
- B. If my parents knew I drink they'd die . . . I'm just miserable with fear that I might be discovered.
21. A. My sister and I have many arguments . . . we are frequently fighting about something or other.
- B. My sister is so hateful . . . I'll never get along with her . . . she makes me so angry and upset.
22. A. My grades could be higher and several of my friends have better grade point averages than I do.
- B. I'm really stupid if I don't do as well as my friends . . . I feel so dumb and worthless.
23. A. My grades are not reflective of my ability . . . my parents have made it clear to me that they want me to work to my ability in college.
- B. If I don't make top grades in college, it will kill my parents . . . I'd hate myself if I disappointed them . . . my grades make me feel so guilty.
24. A. My parents are often provoked by one thing or another into losing their tempers.
- B. My parents are so hot-headed, it's awful . . . they make me so nervous and upset.
25. A. My grade point average on my last report card was lower than I wanted it to be.
- B. My grades are horrible . . . I'll never do well, I'm such a failure . . . I feel so worthless and depressed.
26. A. Several girls I know have different moral and ethical standards from mine, and I find myself disagreeing with them.



- B. I don't like these girls and their morals . . . I should like everyone . . . I'm just a stuck-up prude . . . I feel so guilty and anxious.
27. A. My parents and I disagree on certain moral issues or beliefs . . . my ideas about how to live in this society are different from theirs.
- B. I never can talk to my parents . . . it's awful that they can't understand me . . . I'm so lonely and upset by this.
28. A. My parents talk frequently about grades as a measure of my ability to do college work.
- B. If I don't do well, it will kill them . . . I get so anxious and worried about grades.
29. A. I can remember several times when I made mistakes, failed at something, or when my performance has been inferior to someone else's.
- B. I am such a failure . . . something terrible is wrong with me, I am so inferior . . . what a worthless nothing I am.
30. A. During high school, my parents talked constantly about me going to college . . . they said it was very important to finish my education.
- B. I was forced into college . . . my parents would think I was stupid if I quit . . . I'm so miserable, I'm bound to fail.
31. A. During the evening hours, some girls in the dorm talk, play music, or make noise while I try to study or read assignments.
- B. I can't study in the dorm . . . I'll never get it all done . . . I'll flunk out, how terrible . . . I get so upset and angry.
32. A. I had sexual intercourse recently and we were not very careful about contraception . . . I wonder if I am pregnant.
- B. I'll probably get pregnant, how awful . . . what could be worse? . . . I'm just worried sick.
33. A. Several times I have been in a situation where a boy wanted me to give in and have sex with him.
- B. Boys are so demanding . . . all they want is sex . . . they make me sick . . . I get so angry and upset at them.
34. A. My parents frequently have arguments with each other about one thing or another.
- B. My parents act like animals . . . it's awful for them to make me so miserable.



35. A. Compared to my friends' parents, my parents are frequently suspicious of my activities, question my judgment, and generally act as if I am untrustworthy.
B. My parents are terribly suspicious . . . they think I'm always headed for trouble . . . it's awful to be spied on constantly.
36. A. My parents frequently make statements comparing my brother and myself . . . they point out that his behavior or accomplishments are better than mine.
B. Being compared constantly is terrible . . . it makes me feel so low, worthless, and miserable.
37. A. It is disconcerting to sit in a big lecture class with hundreds of other students and listen to a professor who does not know my name.
B. I can't stand big lecture classes . . . they're terrible, I shouldn't have to take them . . . I get so angry and upset.
38. A. Sometimes when I am with a certain crowd, I behave in a manner that some people would consider morally wrong.
B. I behave immorally in a crowd . . . I must or I'd be rejected and disliked, how awful . . . I feel so degraded.
39. A. It is unpleasant to sit in a classroom waiting to take a test that I have studied all night for.
B. If I failed a test, I'd look really stupid . . . failing is terrible . . . I get so upset worrying about it.
40. A. Of the boys that I have known, I would not choose any as my husband.
B. Finding a lifetime mate is an impossible problem . . . I'll never find anyone, it just seems hopeless . . . I get so depressed.
41. A. Several times when I have been out with a sexually persistent boy whom I liked very much, I have been undecided about how far to go sexually.
B. I should not let boys go too far . . . being so indecent would be terrible . . . sex makes me so upset and guilty.
42. A. I very rarely talk to any member of my family about personal matters . . . no one offers me any advice about my problems.
B. I desperately need someone to confide in . . . I have serious problems but my family doesn't care . . . I feel so lonely and neglected.
43. A. I frequently tell my parents that college is difficult, but they say it is not all that bad.



- B. My parents don't understand my problems . . . they don't care, how awful . . . I can't stand it, I feel so dejected and upset.
44. A. In order to pay my college expenses, I must work part-time while I go to school.
- B. It's not fair that I have to work so hard . . . I'll never get everything done . . . I feel so overworked and miserable.
45. A. When I meet a boy for the first time, I usually do not talk very much.
- B. I have trouble talking to new boys . . . it's awful being so nervous . . . I'm so stupid and clumsy.
46. A. I have never told a boy I was dating that I loved him and really meant it.
- B. I'll never fall in love . . . it's awful being so unloving and unfeeling . . . I get so depressed about myself.
47. A. I cut more classes than my professors allow, and because of this poor attendance, I miss lecture material that is covered on the exams . . . this could lower my grades.
- B. I cut too many classes . . . I'm so lazy, I just can't make myself go, it's awful . . . I feel so anxious and guilty.
48. A. My parents have, on many occasions, expressed their disapproval to me of some of my friends.
- B. Being nagged about my friends is horrible . . . I feel so angry and mistreated when this happens.
49. A. I need to be motivated to study and read for my courses if I am truly going to make good grades.
- B. I just can't study . . . it's terribly boring and unpleasant . . . I'm so upset and worried, I may flunk out.
50. A. Sometimes when I am with a boy, he will say things to tease or ridicule me.
- B. Teasing is so humiliating . . . ridicule is terrible . . . I feel so stupid, unwanted, and worthless.
51. A. I know several boys who like to talk to me and tell me things, but they never ask me out for a date.
- B. Boys treat me like one of the guys . . . I must have no sex appeal . . . I'm repulsive . . . I feel so worthless, upset, and depressed.
52. A. My parents have frequently expressed their disapproval to me of my current boyfriend.



- B. My parents are so bossy . . . their constant butting in makes me so mad . . . I hate it.
53. A. My brother and I have many arguments . . . we are frequently fighting about something or other.
- B. My brother is so hateful . . . I'll never get along with him . . . he makes me so mad.
54. A. Compared to my friends' parents, my parents have strict rules for my social life, my studies, and the amount of money I spend.
- B. My parents are dictators . . . they never let me do anything I want to do . . . they make me so mad . . . I feel so mistreated and controlled.
55. A. I very rarely find myself thinking about God and religion, and I have not been attending worship services regularly.
- B. God just isn't very important now . . . such thoughts are terrible sins . . . I feel so wicked and guilty.
56. A. My grade point average is lower now in college than it ever was when I was in high school.
- B. My grades are bad . . . I'll never do well . . . I'm going to fail . . . I get so depressed . . . it's all hopeless.
57. A. My parents have frequently told me that I spend more money than they believe I need to spend.
- B. My parents are so stingy . . . I never get the things I want . . . I feel so neglected and deprived.
58. A. Compared to my friends, I am overly serious . . . I do not laugh or joke around very much.
- B. I'm too serious . . . it's awful never having any fun . . . life is so depressing for me.
59. A. A college degree is more important in getting a well-paying job today than it used to be, but it doesn't guarantee success.
- B. Without a degree I'll never be anything . . . I'm so afraid, I know I will fail . . . I feel so upset and worthless.
60. A. Because my parents make less money than other parents, my background is different than girls I know at school.
- B. I'm ashamed of my lower class background . . . I'll never be accepted . . . I feel like worthless trash.
61. A. I like to spend most of my time at school with other girls, and I spend very little time with boys.



- B. It's bad being with girls so much . . . people will think I'm queer, how embarrassing . . . I'm really beginning to worry about myself.
62. A. My boyfriend wants me to marry him soon, but I probably would have to quit school and work if we did get married.
- B. Marriage now could ruin my life . . . it would be terrible if I made the wrong choice . . . I'm miserable over making this decision.
63. A. When I am around boys, I do not talk as much as other girls do.
- B. I'm too timid . . . it's awful never being popular . . . I get so nervous, I feel like a wallflower.
64. A. Even with my boyfriend or best girl friends, I hardly ever find myself talking about personal feelings and emotions.
- B. I just can't relate my feelings . . . it's awful not being able to express emotion . . . I feel so anxious and pent up.
65. A. Compared to other girls I know, I have few dates, few other extracurricular activities, and not much of a social life on campus.
- B. College is so lonely . . . there's never anything for me to do . . . I feel so isolated, alone, and depressed.
66. A. I am aware that my feelings are hurt when people say derogatory things to me.
- B. People are so nasty and insulting . . . it's terrible when they are unkind . . . I get so upset and hurt.
67. A. There are some things I would like to do or try which I know my parents would disapprove of.
- B. If my parents found out, I would just die . . . I feel so guilty just thinking about disobeying them.
68. A. I find that listening to a chemistry lecture and taking notes or reading my chemistry book is difficult.
- B. I can't understand chemistry . . . it's terrible just knowing I'm going to fail . . . I get so confused and upset.
69. A. Very rarely do people I know come right out and tell me that they like me.
- B. People don't like me . . . it's terrible being disliked and rejected . . . I feel so worthless and unwanted.



70. A. I do not tell my parents that I love them or show appreciation for what they do for me very often.
- B. I'm so selfish . . . I can't ever show appreciation to my parents . . . I feel so guilty . . . I'm such an ungrateful child.
71. A. I never drink alcoholic beverages, although most of the crowd I know do drink.
- B. My friends who drink reject me . . . it's terrible being discriminated against for my beliefs . . . I get so depressed.
72. A. I am not sure that I want to be completely independent of my mother and father emotionally or economically.
- B. I need someone to lean on . . . I'll never be mature . . . I feel so miserable and alone without my parents.
73. A. There are many different majors . . . I must decide upon one of them . . . several of them promise a rewarding career and future.
- B. I can't decide on a major . . . it's awful, I'll never make up my mind . . . I just worry constantly.
74. A. Registration procedures offer a number of difficulties: closed courses, unavailable advisors, and confusion about proper procedures . . . problems might delay my graduation.
- B. I'll never get the classes I need . . . I'll never graduate . . . I get so angry and upset with red tape.
75. A. Besides having to study, I have many other things to occupy my time, such as dating, clubs, shopping, television, and girl friends.
- B. I have too much to do . . . it's terrible never having enough time to study . . . I get so rushed and anxious.
76. A. I can remember being with a boy who wanted physical contact with me, like holding my hand, putting his arms around me, or kissing me.
- B. Sex is dirty . . . I'd be so cheap if I made out with boys . . . I get so upset when they touch me.
77. A. Compared to other girls who are my age and height, I am several pounds overweight.
- B. I'm too fat . . . no one likes obese, ugly people like me . . . I just hate myself.
78. A. Most of the courses I take concern academic subjects and problems and do not include problems encountered in everyday life.



- B. College is irrelevant to life . . . I hate my courses . . . it's awful never learning anything important . . . I get so disgusted and upset.
79. A. Some girls I know have said they are jealous because they are not as pretty as I am and have fewer boy friends and less expensive clothes than I do.
- B. Other girls are jealous of me . . . it's just terrible, everyone should like me . . . I feel like my friends hate me.
80. A. I do not have an advisor . . . the one I want will not accept any more students as advisees.
- B. I'll never find an advisor . . . it's a terrible hassle . . . I get so upset worrying about getting one.
81. A. I am steadily dating a boy whom I like very much . . . sometimes I think I am in love with him, and sometimes I think I am not.
- B. I worry wondering if this is really love . . . being unsure is terribly confusing and disturbing . . . I think I'm going crazy over this.
82. A. I have only one parent who is available to talk to about my problems and to give advice.
- B. Having one parent is terrible . . . I should have two . . . life sure mistreated me . . . I get so depressed.
83. A. I wanted to join a sorority and I went out for rush, but I did not get a membership bid to any of them.
- B. Only the best girls get in a sorority . . . I couldn't get in one . . . I'm such a creep . . . I feel like a worthless nothing.
84. A. I often find that when I do or say something I think is funny, others do not laugh or smile . . . they don't seem to appreciate my sense of humor.
- B. People don't like my sense of humor . . . it's awful that people don't approve of me . . . I feel so rejected and disliked.
85. A. I am thinking of quitting college . . . my parents have told me they want me to stay in college.
- B. My parents will think I'm a quitter if I quit college now . . . they'll think I can't make it, that I'm dumb . . . that would be awful.
86. A. I am taking a course from a teacher who conducts his class in a way that I do not like.
- B. This teacher is rotten . . . it's terrible that I should have to take his course . . . he really makes me sick.



87. A. It seems like I have hundreds of pages of reading to do each week . . . it has to be done if I am going to make good grades.
B. I just can't read so much . . . it's awful, I shouldn't have to do so much . . . it makes me so tired and upset.
88. A. I want to date several boys, but I have been asked to go steady.
B. If I don't go steady, I may never get any dates . . . that would be terrible . . . I get so upset and confused.
89. A. When I am around others, I think about my own self-centered interests, and I also talk a great deal about myself.
B. I'm too self-centered and selfish . . . everyone must hate me . . . I'm such a conceited, stuck-up bitch . . . I feel so guilty and ashamed.
90. A. My parents frequently make statements comparing my sister and myself . . . they point out how her behavior is better than mine.
B. Being compared and ridiculed constantly is terrible . . . I don't deserve such treatment . . . it makes me feel so low and worthless.
91. A. My parents want me to do what they tell me to do and to do things their way . . . they don't encourage independence.
B. My parents' meddling is terrible . . . they'll never let me alone . . . I get so angry and hateful at them.
92. A. My face, hair, figure, and general appearance do not correspond to current standards of beauty.
B. I'm not attractive . . . no one likes an ugly person like me . . . I feel so creepy and worthless.
93. A. My life style seems to be frivolous, because I spend most of my free time dating, going to parties, and socializing.
B. I am too superficial . . . I can't be serious . . . my life is hopeless and meaningless.
94. A. Being caught while cheating has damaging results, such as flunking the exam, the course, or even being expelled from the university.
B. I'm a dishonest cheater . . . I'm despicable, but I must cheat to pass . . . I'd just die of embarrassment if caught.
95. A. I can imagine myself being uneasy with lots of other people and being introduced to several strangers.
B. Social situations make me ill-at-ease . . . it's awful being so backward and uncomfortable . . . I feel so stupid and nervous.



- 96.* A. One of my parents is in poor health . . . the doctor says his (or her) condition is serious.
- B. If he (or she) dies, I can't go on . . . I'm worried sick about him (or her) dying all the time.
- *Two dyad slide sets were prepared, one for father, one for mother.
97. A. I find that sitting listening to a math or science lecture and taking notes or reading my math or science book can be difficult.
- B. I can't understand math or science . . . they're impossible, I know I'm going to fail them both . . . I get so confused and frustrated.
98. A. My parents rarely kiss, hug, or tell me that they love me . . . they rarely tell me that they like the things I am doing.
- B. My parents must hate me . . . I deserve to be loved, it's terrible not to be . . . I feel so unloved, depressed, and worthless.



APPENDIX E

NEUTRAL SENTENCE DYADS



APPENDIX E

NEUTRAL SENTENCE DYADS

- C1. A. Either something has caused the electricity to go off, or the light bulb in my lamp has burnt out.
B. A check shows there is nothing wrong with the electricity, therefore the light bulb in my lamp must be burnt out.
- C2. A. If the prices are lowered on beef, then the consumption of pork, fish, and fowl will go down.
B. The prices on beef are going up, therefore a rise in the consumption of pork, fish, and fowl is forthcoming.
- C3. A. Every sixteen year old who passes the required tests and exhibits sufficient capabilities is issued a driver's license.
B. Edgar passed the required tests and impressed the examiner with his capabilities, therefore he was issued a driver's license.
- C4. A. No person who has not attained the age of 18 will be allowed to vote in any national election.
B. Mary Anne, who will be 17 years old in January, will be unable to vote in the 1976 presidential elections.
- C5. A. Either history is wrong or Eli Whitney was the inventor of the cotton gin.
B. Patent records give unmistakable evidence to the fact that Whitney invented the cotton gin.



APPENDIX F

SUBJECT CONSENT FORM



APPENDIX F

SUBJECT CONSENT FORM*

Date _____

1. I have agreed to participate in the present research study of my own free will.
2. I understand that I am free to discontinue my participation in the project at any time.
3. I understand that the data collected in this project will be treated with strict confidence, and any data collected based on my performance will be used completely anonymously.
4. I understand that any aspects of the project that are not explained before it is carried out will be explained, upon request, at its completion.
5. I realize that I am expected to refrain from discussing the experiment and my participation in it until May 31, 1975.

Signed _____

If you wish to receive an abstract of the results of the study, please fill in your summer address below.

*Adapted from: Yager, G. G. The effect of the covert behaviors of visual imagery, self-monitoring, and self-evaluation upon the overt expression of emotional words. Unpublished Doctoral Dissertation, Michigan State University, 1973.



APPENDIX G

TRANSCRIPTS OF FOUR COGNITIVE RESTRUCTURING GROUP TREATMENT TAPES



APPENDIX G

TRANSCRIPTS OF FOUR COGNITIVE RESTRUCTURING GROUP TREATMENT TAPES

Tape 1: "Love and Approval"

Introduction

The tape recorder has been activated because of your response to the last pair of sentences that you read. For the next few minutes, I want to talk to you about that reaction, to explain why you might have reacted as you did, and to suggest some ways that you might be able to control that reaction. Most of what I will say is based upon the ideas and practices of a nationally known psychologist, so I'd like you to just lean back, relax, and listen. The experimenter will ask you for your impressions at the end of this experiment.

You've been placed in a situation which for most people is anxiety producing. You're in an unfamiliar surrounding, hooked up to a rather mysterious piece of equipment and asked to read aloud pairs of statements, including a pair of statements which involves a highly personal concern of yours. Most people would react somewhat anxiously to this kind of a situation, and it's interesting to note that your emotional reaction, as well as most other people's, was most extreme when you read the first sentence in the problem sentence pair. This was the pair of sentences which involved a highly relevant concern of yours. I'd like you to think back on the first sentence in that sentence pair for a moment . . . (sentence A was flashed on the screen for a few seconds) . . . Basically, it was an objective statement of fact, wasn't it? It was a declarative, non-evaluative sentence about some aspect of your life. It was a specific series of words, which for most people would probably not have been anxiety producing. And yet, for you, it did produce anxiety.

O.K., so far we know that you read a particular sentence, and you reacted emotionally to it. Now, if we leave the analysis there for a moment, it sounds as if certain events, in this case a certain set of words, can cause you anxiety in much the same way that a physical blow causes bodily pain. The comparison stops there though, because psychological research suggests that external events or objective statements cannot cause emotion. Something comes between the event and the emotional reaction, and that something causes the anxiety. The something which comes between the event and the reaction is the interpretation you place on that event or statement.

For example, suppose you step out of an elevator, and suddenly a stick strikes you across the shins. What's your immediate reaction?



Probably anger. You may even want to hit back. Then you look up and find that the person with the stick is blind. You then might feel pity or even guilt. What happened to your emotions in that situation? They changed as your interpretation of the situation changed. In the same way, we influence our emotions by our interpretation of events. And these interpretations include our thoughts, or what some people have called our self-talk.

In other words, emotions are not caused by situations or events, nor do they arise magically or mysteriously out of the air. Rather, our emotions result from our beliefs, our ideas and attitudes about the events.

To make what I am saying more understandable to the problem at hand, let us look at it as an ABC situation. (At this point, the subject was given a supplementary handout, Appendix H.) A is the objective statement of fact; it is the activating event; something happens; someone says or does something. In this case you're doing something when you think about your personal problem. Now let C represent your emotional reaction, how you feel as a consequence of the activating event A. In this case, you feel anxious. However, it is not A which causes C. In fact, if A caused C, then everyone would react with the same emotions to similar environmental events. Rather, it is what you tell yourself about A--at point B--that leads to the emotion at C. Thus, in order to change your anxiety, you need to focus your attention on point B, on what you are telling yourself about A. These are your self-statements, or your self-talk, the words and sentences you tell yourself about A. They may also be referred to as your belief system. One difficulty in changing your thoughts though is that your interpretations and self-talk at point B are so automatic that you are often not even aware that you are upsetting yourself in this way. So the first step is to slow the process down, and try to examine closely your self-talk at point B. As you begin to become aware of your self-talk, you will realize that it is probably much like the second sentence you read. That is, it involves negative and critical statements, which are unrealistic, illogical, and irrational assumptions. These kinds of statements you would probably object to, if you heard a friend say them to someone else.

"Love and Approval"

The problem which you have identified as concerning you centers around the notion that it is extremely important for you to have the approval and affection of other people. Most of us feel that approval from others is beneficial and desirable. But is it an absolute necessity? Must we be unhappy if someone does not approve of us? Possibly that is what you are telling yourself, that is, that you must have other people's approval or affection and that you cannot stand to live without it. We all know that very young children and infants need love and affection from adults, primarily from their parents. In fact, psychological studies have shown that if children are deprived of parental or adult affection they very often become emotionally and even physically



retarded. But this does not hold for adult human beings; they do not have physical and biological needs for the love and approval of others. So, if you have been telling yourself that you must have other people's approval and affection, then you have made others' approval of you an emotional necessity; you have made their good opinions a pre-condition for your own self-acceptance and happiness. And that's a real trap, because under those conditions, no one will ever become a full and satisfied human being. No one will ever be fully approved of or loved by everyone else for everything he or she does, and no doubt a person who expects that she should be will be anxious and worried about whether she can win and maintain the approval of others.

Anxiety of this type is to a considerable extent an over-concern with "what will others think of me?" Certainly it's pleasant, practical, and desirable when others think well of us, and we may never learn to like disapproval and negative criticism from others, but we can learn to tolerate it and even to use it for our own good. There are several other reasons why it is illogical for anyone to insist that she be loved and approved of by all those who are important to her. For one thing, this is a perfectionistic, unattainable goal. Some people will disapprove of you for reasons entirely beyond your control. Moreover, what you do to please one person may well displease someone else. And you cannot be sure that the people who accept you now may not for some reason change their minds about you in the future. In other words, there's no guarantee that you will win the approval of any individual or group, no matter what you do. And if you make that a pre-condition for your own happiness, then you are bound to be miserable. Most important of all, whether or not anyone else loves you, you are still a worthwhile human being, worthwhile to yourself simply because you exist and because you have potential for enjoying life. The problem is, how can you keep from upsetting yourself when you don't get the approval you seek?

First, you must be aware that these kinds of irrational statements and unreasonable demands are a part of your self-talk; they are the irrational beliefs you tell yourself at point B. Second, you must attack the unreasonable assumptions on which they are based. Dispute, question, and challenge those beliefs. Who says that you must be approved of by everyone to be happy? Who dictates that you must be miserable when someone appears to not approve of you? Third, to change this irrational thinking, you must assert and practice some new, more adaptive and more appropriate sentences at point B. For example, instead of saying, "It's awful and terrible that I am not approved of by everyone"; "How can I stand not to be loved by that person?" you can say, "It is definitely nice to have people's love and approval, but even without it I can still accept and enjoy myself." Now, for just a moment, I'd like you to think back on sentence B, and I'd like you to try to think of more adaptive kinds of statements you could substitute for sentence B. (Sentence B was flashed on the screen for a few seconds.)



Conclusion

These are the kinds of sentences that anxious people tell themselves, and by looking at them, seeing how silly they are, and working to replace them with more reasonable ideas and demands, you'll soon have your anxiety on the run.

In summary, the main idea that I'm trying to present is that your feelings of anxiety result primarily from the kinds of thinking that you're doing. Anxiety is basically an irrational fear, and the kinds of sentences you're telling yourself about the so-called anxiety-provoking situation are based upon irrational ideas. It's this kind of nonsense, and the self-talk upon which it is based, that give you, and help to maintain, your anxiety. Facts alone cannot create anxiety. Thus, by changing your self-talk, you can rid yourself of anxiety, or at least considerably reduce it. So when you approach a potentially fearful situation, or anxiety-producing event, and you feel the tension start to build, take a good, hard look at what you're saying to yourself. See whether you are turning reasonable desires into ridiculous demands. See whether you're grossly exaggerating the consequences should those demands not be met. Analyze, challenge, and contradict those ideas. Remember that because you have thought this way in the past, it does not mean you should continue to do so now or in the future. By working at substituting more appropriate, more rational ideas for irrational ones, you will no longer become highly anxious, and you can rid yourself of anxiety if it arises.

In the next few minutes I want you to think of your own highly relevant concern in terms of A-B-C. If you can change the Bs--the unreasonable self-critical talk--you can change your emotional reaction. Try to think of different, more adaptive self-talk. Remember, in the same way that you choose to magnify and awfulize a situation, you can choose to de-awfulize it.

Now just relax for a few minutes until you are given instructions to continue.

(Time: 13 minutes)

Tape 2: "Perfectionism"

Introduction

Same as Tape 1.

"Perfectionism"

The problem which you have identified as concerning you centers around the notion that it is extremely important for you to be thoroughly



competent, adequate, and achieving in most everything you attempt. Most of us would like to be good at the things we do. It is desirable, for example, to achieve good grades in college, because by doing so we increase our chances of going on to graduate school or securing a well-paying, interesting job. But is it an absolute necessity to be completely competent? Must we be unhappy and miserable if we do not meet our own unreasonable standards? Possibly that is what you are telling yourself, that is, that you must be totally competent and achieving if you are to be a happy and worthwhile person. If this is at all true of you, then you have made your own behavior an emotional necessity; you have made your own achievement a pre-condition for self-acceptance and happiness. And under that kind of a condition, anyone would become anxious and worried about their performance.

Anxiety is to a considerable extent an over-concern with "perfectionism." It is not simply the desire to do well, or even perfectly, on one particular piece of work, or in one area of human endeavor; rather, it is the notion that one must be perfect, the best, in virtually every respect that you and other people care about and consider important. This is an impossible goal. No one can be perfect in everything they attempt. Further, when that is your goal, you set yourself up for failure and serious disappointment.

Achievement is not, except by arbitrary definition, related to your intrinsic worth . . . that is your self-worth. Extrinsic worth is the value others place upon you because you are a good typist, an honor student, a champion athlete, or whatever. To be highly valued in this way will indeed make you "better off," better able to enjoy the riches of life. But not to be so valued by others does not mean that you must devalue yourself, consider yourself a nothing. People frequently get themselves into emotional trouble by saying, "I have failed," and then illogically adding, "I am a failure." All that it does prove is that you are a person who sometimes fails, who makes mistakes, who has shortcomings. That truly includes all of us. It doesn't, however, make any of us a lesser person or even necessarily unhappy. It is only by our telling ourselves that we are horrible failures when we don't achieve what we set out to achieve that we become miserable. The problem, then, is how can you keep from upsetting yourself when you don't succeed in the manner in which you hoped you would?

First, you must be aware that these kinds of irrational statements and unreasonable demands are a part of your self-talk. Second, you must attack the unreasonable assumptions on which they are based. Dispute, question, and challenge these beliefs. For instance, what law says that you must be completely competent and successful to be happy and satisfied with yourself? Who dictates that you must be miserable when you don't meet unrealistic standards? Where is it written on stone tablets that you must be perfect in everything you do and that if you're not perfect you are a worthless human being? Third, assert and practice some new, more adaptive, and more appropriate sentences at point B. For example, instead of saying, "It's awful and terrible that I have not



achieved what I set out to achieve; I can't stand being a failure," say instead, "It is nice to accomplish my goals, but even if I fail, I can still accept and enjoy myself; I can just accept the fact that I did the best I could and be satisfied with that." For just a moment, I'd like you to think back on sentence B, and I'd like you to try to think of more adaptive and helpful kinds of statements you could substitute for it. (Sentence B was flashed on the screen for several seconds.)

Conclusion

Same as Tape 1.

(Time: 12 minutes,
20 seconds)

Tape 3: "Blaming"

Introduction

Same as Tape 1.

"Blaming"

The problem which you identified as concerning you centers around the notion that people (to include yourself) who behave in unacceptable ways should be severely blamed and punished for their misdeeds. Most of us feel that people should be held accountable for their actions. But is it absolutely necessary that we blame and castigate ourselves or others when we or they misbehave? Must we blame and feel bitter when we note unacceptable behavior? Who says that we must feel miserable when others engage in unacceptable behavior, or when we do something we would rather not do? If these kinds of thoughts are true of you, then you have made correct behavior an emotional necessity. You have made the appropriate actions of others or yourself a pre-condition for your happiness. Under those kinds of conditions, anyone would be anxious and miserable when things go wrong, as they surely will.

Anxiety, or at least a kind of anxiety, is to a considerable extent an overconcern with "immoral" behavior. It is not simply the desire that others, or you, act in very circumscribed, well-defined ways. It is the notion that when people do not behave in those ways, we must spend our time blaming and criticizing them, or ourselves, and making ourselves miserable, as if blame, punishment, and misery alone will alter the situation. This kind of thinking puts you in an impossible position, because there will always be people whose behavior does not conform to your standards. This may be through ignorance on the



part of the person who misbehaves, or it might involve an error in judgment. In any event, blaming that individual, or yourself, for inappropriate behavior will probably make matters worse. It certainly won't encourage him to change. And the same thing can be said about your own misdeeds. Blaming won't make you less stupid or less error-prone; it will only make you more upset and more likely to engage in inappropriate behavior. So the question then becomes, how can you stop blaming and stop saying things that make you emotionally upset?

First, you can try to realize that misdeeds often arise out of ignorance, stupidity, or poor judgment. Second, when you blame yourself, see if you were wrong, and take steps not to misbehave again. Third, you should become aware of the unrealistic standards you place on yourself and others. Begin to question the unreasonable assumptions upon which your blaming is based. Dispute, question, and challenge those beliefs. For instance, what law says that you must blame others, or yourself, when unacceptable behavior is exhibited? Who dictates that when you are aware of misdeeds you must blame the doer? What good is it anyway just to stand around blaming each other for misbehavior or differences of opinion? Finally, assert and practice new, more adaptive self-talk at point B. For example, instead of saying, "People must be blamed and punished for misbehavior," say, "It's unfortunate that people, including myself, make mistakes, but it won't affect my happiness; I'll just try to learn from my mistakes, make the most of a bad situation, and try not to make the same mistake again and again." For just a moment, I'd like you to think back on sentence B, and I'd like you to try to think of more adaptive kinds of statements to replace it. (Sentence B was flashed on the screen for a few seconds.)

Conclusion

Same as Tape 1.

(Time: 11 minutes,
40 seconds)

Tape 4: "Catastrophizing"

Introduction

Same as Tape 1.

"Catastrophizing"

The problem which you have identified as concerning you centers around the notion that it is awful and even catastrophic when things are not the way you want them to be. Most of us would like things to go our way. But is it an absolute necessity that they do? Must we be unhappy and miserable when they do not? Possibly, what you are telling yourself



is that, "Situations I am in must be just the way I want them or I cannot be happy." If this is true of you, then you have made certain environmental events an emotional necessity; you have made situations over which you have very little control a pre-condition for your happiness. And with those kinds of requirements, anyone would be anxious and miserable when things go wrong, as they surely will.

Anxiety, to a considerable extent, is an over-concern with "the way things ought to be." It is not simply a desire that things be a certain way; rather it is the notion that things have to be a certain way in order for you to be happy. This is an impossible requirement. No one can have everything go just the way they would like. And when preference becomes necessity, the result is emotional upset. Furthermore, there are several reasons why it is illogical to insist that "things go my way." First, there is often no reason why things should be different. Second, just wanting things to be different won't make them different. Third, getting upset doesn't help but often makes one more disorganized and ineffective. Fourth, if change is impossible, getting upset hurts no one but yourself. The problem then becomes, how can you keep from upsetting yourself when things don't go your way?

First of all, you can determine if the situation can be changed and if you can set about changing it. If it can't be changed, or if change is slow in coming, then try to perceive your own catastrophizing. Become aware of the unreasonable demands which you place upon the situation. Also, begin to question the unrealistic assumptions upon which they are based. Dispute, question, and challenge those beliefs. What law says things must happen exactly as you'd planned them in order for you to be happy? Who dictates that if they do not, you must feel miserable and upset? Just because things aren't going well, why do you think you can't stand it? Finally, assert and practice new, more adaptive self-talk at point B. For example, instead of saying, "It's awful and catastrophic when things don't go my way; I can't stand it," you can say, "It would be nice if things went my way, but I can be happy and still enjoy myself if they don't. Just because the world isn't set up so that things go my way 100% of the time, doesn't mean I can't make the best of an unfortunate situation." For a moment I'd like you to think back on sentence B, and I'd like you to try to think of more adaptive and helpful kinds of statements to replace it. (Sentence B was flashed on the screen for a few seconds.)

Conclusion

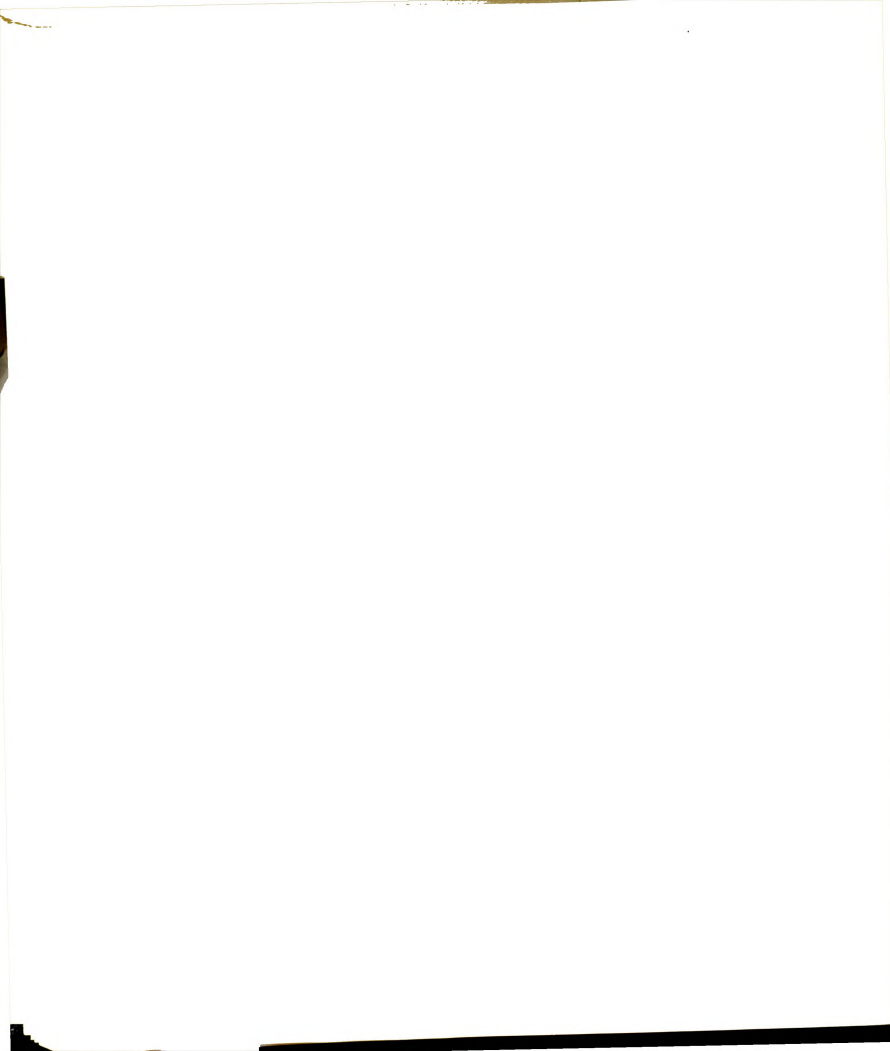
Same as Tape 1.

(Time: 11 minutes,
45 seconds)



APPENDIX H

TAPE SUPPLEMENT



APPENDIX H

TAPE SUPPLEMENT

I. MAJOR PREMISE:

WE FEEL AS WE THINK!

"Men are not disturbed by things, but
by the views which they take of them."

Epictetus (circa 200 B.C.)

II. A PSYCHOLOGICAL ANALYSIS OF ANXIETY

A = Activating event--A situation or event typically initiates the anxiety sequence. These events might be our own thoughts or images.

B = Belief system--This includes attitudes, beliefs, or ideas about A--often automatic and out of our awareness.

C = Emotional consequences--This is what we experience as anxiety, that is, rapid heart rate, sweaty palms, etc.

Postulates

1. A does not cause C. Because the belief system and "self-talk" about A are so automatic and instantaneous, many people are not aware of them and assume that A causes C, much as a physical blow causes pain.
- Rather 2. B causes C. In reality, our interpretation of A, that is, what we tell ourselves about the significance of the activating event, dictates our response to A.
3. The sequence then is $A \rightarrow B \rightarrow C$.

III. HOW TO CHANGE NEGATIVE EMOTIONAL REACTIONS

1. Become aware of B statements and the illogical assumptions upon which they are based.
2. Change the Bs by disputing the irrational assumptions and statements. Actively challenge the beliefs. Begin to make more rational and emotionally healthy statements and inferences about A.
3. Experience the positive results of changing Bs: an anxiety-free reaction to A. This does not mean that you become "unemotional" but rather that your emotional reaction is not the rigid response of anxiety but one which is healthy and flexible.



APPENDIX I

COED PROBLEM CHECKLIST ITEMS CATEGORIZED BY IRRATIONAL IDEA



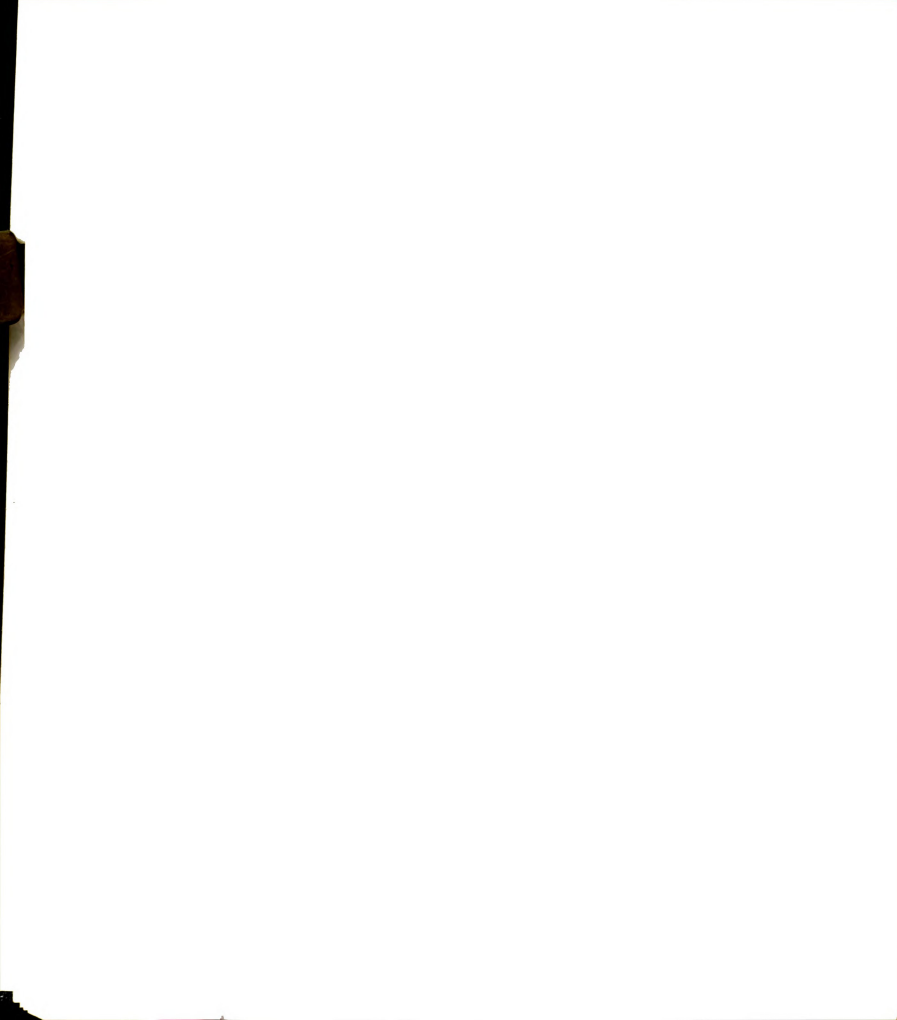
APPENDIX I

COED PROBLEM CHECKLIST ITEMS CATEGORIZED BY IRRATIONAL IDEA

Irrational Idea #1

"It is a dire necessity for an adult to be loved or approved by almost everyone for virtually everything he does."

- 2. I worry about getting enough dates.
- 5. I feel insecure around people, even my friends.
- 8. I worry about being liked by dates.
- 14. I am embarrassed by public speaking, even just expressing my ideas in class.
- 23. I am afraid of disappointing my parents with my grades.
- 36. I am always being compared unfavorably with my brother.
- 38. I do things that are morally wrong to please the crowd I am with.
- 45. I cannot talk to boys when I first meet them.
- 50. I am afraid of being ridiculed by boys.
- 51. I do not have any dates because boys treat me like one of the guys.
- 61. I spend too much time with other girls.
- 63. I am timid and socially backward around boys.
- 67. I am afraid to do things because my parents might disapprove.
- 69. I am afraid other people do not like me.
- 77. I feel self-conscious about the fact that I am overweight.
- 79. Other girls are jealous of me.
- 84. People are offended by my sense of humor.
- 85. My parents will not approve if I quit college.
- 88. I worry about whether to date one boy or several.



- 90. I am always being compared unfavorably with my sister.
- 92. I feel self-conscious about my appearance.
- 95. I feel out-of-place in social situations.
- 98. I feel my parents do not love me.

Irrational Idea #2

"One should be thoroughly competent, adequate, and achieving, in all possible respects."

- 3. I feel so discouraged about my grades I may quit college.
- 4. I have trouble with my psychology course.
- 15. I have trouble with my English course.
- 22. I feel dumb because friends make better grades than I do.
- 25. My grades are not up to my own academic standards.
- 39. I worry too much about tests.
- 47. I worry about my poor class attendance.
- 49. I have a lack of motivation to study.
- 56. My grades are not as good as they were in high school.
- 58. I am always taking things too seriously; I'm definitely overly serious.
- 68. I have trouble with my chemistry course.
- 97. I have trouble with my math/science courses.

Irrational Idea #3

"Certain people are bad, wicked, or villainous, and they should be severely blamed and punished for their sins."

- 10. I criticize other people too much.
- 12. I am shocked by other girls' sexual/drinking behavior.
- 13. I do not feel like I am really being myself.
- 20. I am afraid my parents will find out that I have been drinking.

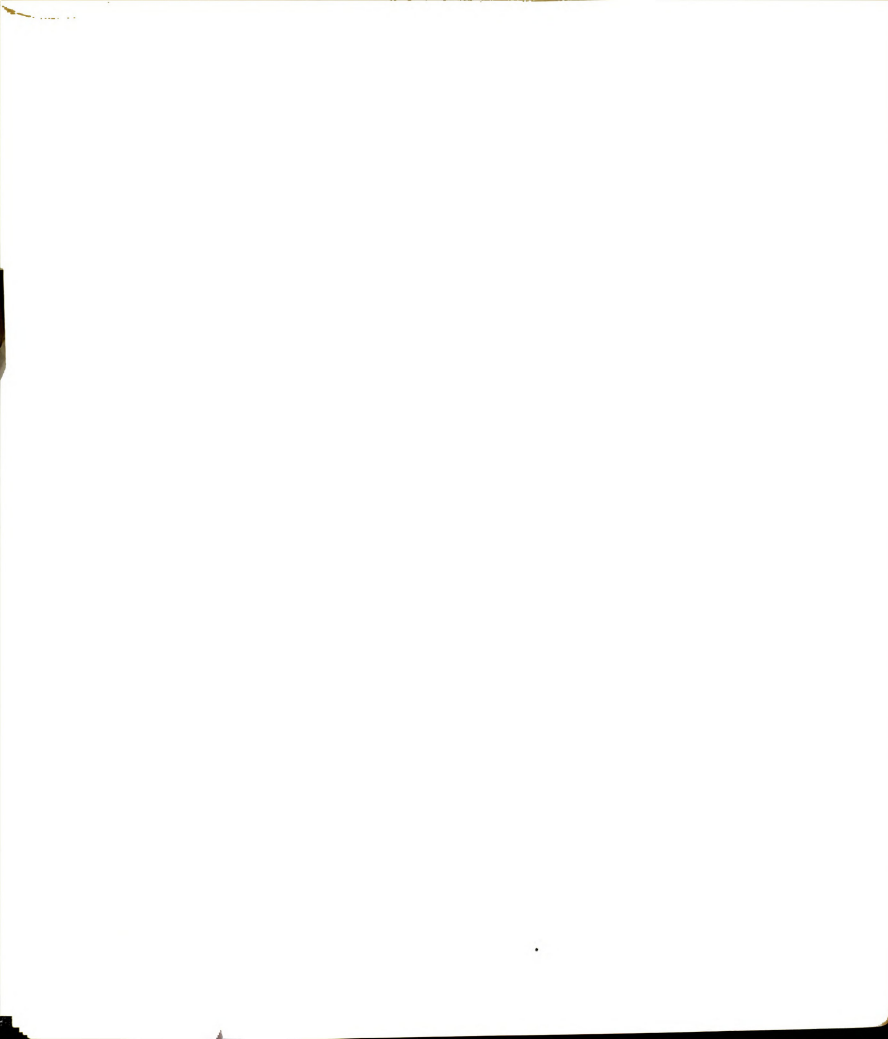


- 21. I cannot get along with my sister.
- 24. My parents are always losing their tempers.
- 26. I cannot relate to other girls who do not share my moral standards.
- 29. I am bothered by feelings of inferiority.
- 30. My parents pressured me too much to go to college.
- 33. Boys put too much pressure on me for sex.
- 34. My parents do not get along with each other.
- 41. I worry about how far to go sexually with boys.
- 53. I cannot get along with my brother.
- 55. I am drifting away from God and my religion.
- 60. I feel ashamed of my lower-class background.
- 64. I cannot share very personal and deep feelings.
- 70. I do not show enough appreciation to my parents.
- 76. Physical contact with boys scares me.
- 83. I am extremely disappointed because I did not get in a sorority.
- 89. I am too self-centered.
- 93. I am occupied too much by socializing and a party-like style of life.
- 94. I worry about getting caught cheating on exams.

Irrational Idea #4

"It is terrible, horrible, and catastrophic when things are not going the way one would like them to go."

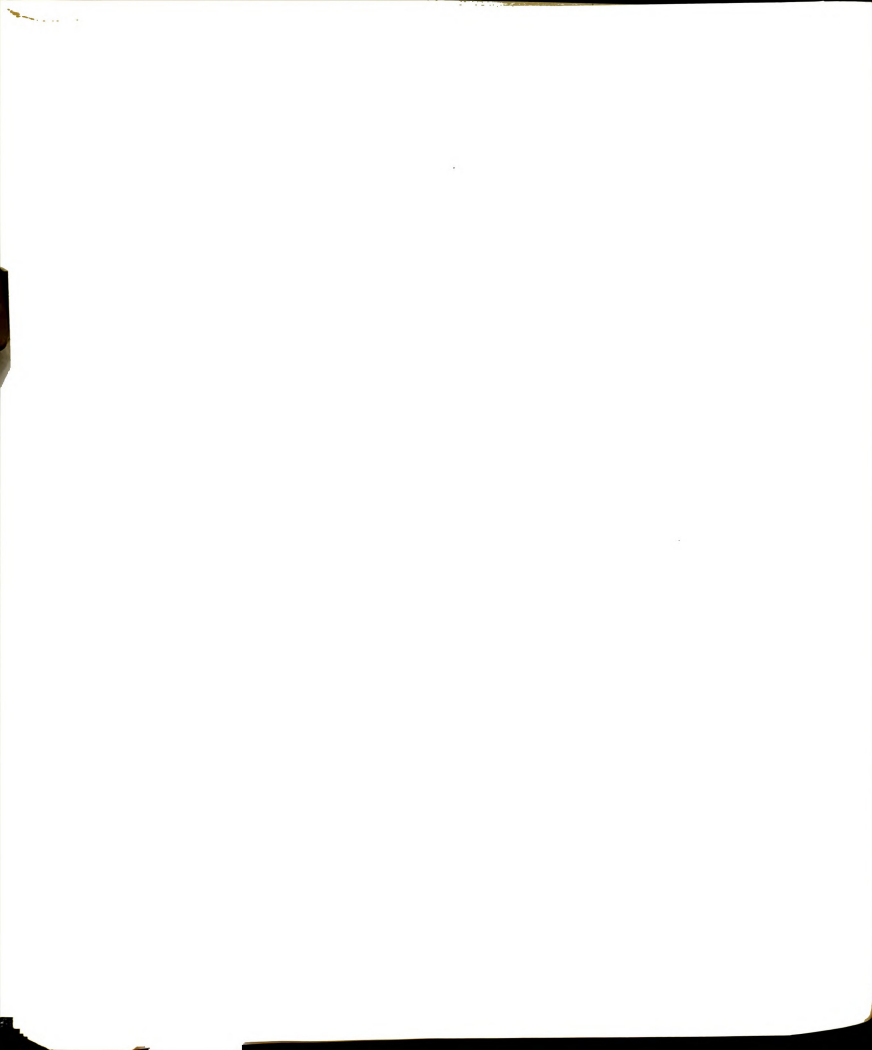
- 1. My parents pressure me too much to have an active social life.
- 6. My parents do not want me to come home very often.
- 7. I do not know how to study in college.
- 9. I worry about maintaining grades to keep a scholarship.



11. My parents will not allow me to be independent.
16. I miss my parents while I am at college.
17. I am in conflict over continuing to date an old boyfriend.
18. I feel there is too much emphasis and pressure on grades.
19. I am in conflict over having sex.
27. My morals/beliefs are different from my parents'.
28. My parents emphasize grades too much.
31. I find it difficult to study in the dorm.
32. I worry about getting pregnant.
35. My parents act as if I am untrustworthy.
37. Big lecture classes are a problem for me.
40. I worry about choosing a husband for the rest of my life.
42. I do not have anyone in my family to talk to.
43. My parents do not understand the pressures and problems of college.
44. Having to work and go to college at the same time is too much for me.
46. I am unable to form a love relationship with a boy.
48. My parents do not like my friends.
52. My parents do not like my present boyfriend.
54. My parents are too strict with me.
57. I have conflict with my parents over money.
59. I view college as more important than it really is.
62. I worry about whether I should get married or finish college.
65. I have almost no social life on campus.
66. I get too upset when people hurt my feelings.
71. I do not fit in with the crowd because I do not drink.



- 72. I do not know if I want to be independent of my parents.
- 73. I cannot decide on a definite major. .
- 74. I worry about getting the right courses for graduation.
- 75. I do not have enough time to study.
- 78. My college courses are irrelevant to life.
- 80. I have trouble and worry about finding an advisor.
- 81. I am unsure if I am really in love.
- 82. I have only one parent.
- 85. I do not like a particular professor or instructor.
- 87. I have too much reading to do.
- 91. I cannot assert my independence from my parents.
- 96. I worry about one of my parents' health.



APPENDIX J

LIST OF POSITIVE WORDS TO COUNTERCONDITION MEANING
(Semantic Desensitization Group)

APPENDIX J

LIST OF POSITIVE WORDS TO COUNTERCONDITION MEANING (Semantic Desensitization Group)

1.	honest	honest	honest	vacation	honest	honest
2.	healthy	healthy	friend	pretty	love	healthy
3.	friend	friend	beauty	sweet	healthy	friend
4.	valuable	valuable	sweet	happy	success	valuable
5.	beauty	beauty	vacation	beauty	friend	beauty
6.	happy	happy	money	valuable	steak	happy
7.	sweet	sweet	gift	friend	valuable	sweet
8.	pretty	pretty	sacred	healthy	sacred	pretty
9.	vacation	vacation	success	honest	beauty	vacation
10.	win	win	healthy	love	rich	win
11.	money	money	valuable	success	happy	money
12.	smart	smart	happy	steak	gift	smart
13.	gift	gift	pretty	sacred	sweet	gift
14.	rich	rich	win	rich	smart	rich
15.	sacred	sacred	smart	gift	pretty	sacred
16.	steak	steak	rich	smart	money	steak
17.	success	success	steak	money	vacation	success
18.	love	love	love	win	win	love



APPENDIX K

LIST OF NEGATIVE WORDS TO CONDITION MEANING (Negative Semantic Conditioning Group)



APPENDIX K

LIST OF NEGATIVE WORDS TO CONDITION MEANING (Negative Semantic Conditioning Group)

1. failure	failure	failure	worthless	failure	failure
2. thief	thief	enemy	bitter	stupid	thief
3. enemy	enemy	disgusting	sick	thief	enemy
4. insane	insane	sick	fear	ugly	insane
5. disgusting	disgusting	worthless	disgusting	enemy	disgusting
6. fear	fear	agony	insane	cruel	fear
7. sick	sick	evil	enemy	insane	sick
8. bitter	bitter	dirty	thief	dirty	bitter
9. worthless	worthless	ugly	failure	disgusting	worthless
10. sad	sad	thief	stupid	sour	sad
11. agony	agony	insane	ugly	fear	agony
12. poison	poison	fear	cruel	evil	poison
13. evil	evil	bitter	dirty	sick	evil
14. sour	sour	sad	sour	poison	sour
15. dirty	dirty	poison	evil	bitter	dirty
16. cruel	cruel	sour	poison	agony	cruel
17. ugly	ugly	cruel	agony	worthless	ugly
18. stupid	stupid	stupid	sad	sad	stupid

APPENDIX L

LIST OF NEUTRAL WORDS (Verbal Flooding Group)

APPENDIX L

LIST OF NEUTRAL WORDS (Verbal Flooding Group)

1. and	and	and	can	and	and
2. ink	ink	key	three	up	ink
3. key	key	note	cup	ink	key
4. hat	hat	cup	glass	car	hat
5. note	note	can	note	key	note
6. glass	glass	string	hat	cord	glass
7. cup	cup	in	key	hat	cup
8. three	three	this	ink	this	three
9. can	can	car	and	note	can
10. room	room	ink	up	fork	room
11. string	string	hat	car	glass	string
12. dot	dot	glass	cord	in	dot
13. in	in	three	this	cup	in
14. fork	fork	room	fork	dot	fork
15. this	this	dot	in	three	this
16. cord	cord	fork	dot	string	cord
17. car	car	cord	string	can	car
18. up	up	up	room	room	up



APPENDIX M

SUMMARY LETTER TO SUBJECTS



APPENDIX M

SUMMARY LETTER TO SUBJECTS

Department of Counseling, Personnel
Services and Educational Psychology
Michigan State University
East Lansing, Michigan 48824

October, 1975

Dear Students:

I am writing this letter to share with you the results of the study in which you participated last spring. Since some of you participated in several psychological research projects, I will further identify the study by noting that your task was to read sentences on a slide projector screen while your responses were monitored by a polygraph.

I spoke with most of you about the general purpose of the study after you had completed your involvement in it. Many of you had questions which I was unable to answer adequately at the time; but now that the results have been tabulated and the data interpreted, I can answer them more fully.

Primarily, the study was an attempt to investigate the way in which the things we say to ourselves affect our emotions and how this "self-talk" might best be changed as a means of controlling emotion. An additional theoretical feature of the study was an attempt to create emotional arousal to "self-talk" where none had existed before.

The particular focus of the study--how we talk to ourselves and what effects this has--falls within a relatively recent trend in psychology known as cognitive behavior modification. Investigators in this area have established that thoughts do indeed control emotions to a considerable extent. Now, models or examples of exactly how this process develops and is maintained are being offered. My study was, in part, a test of one of those models. A more immediately practical question to which the study was addressed is: Can we alter thoughts as a means of controlling emotions, and, if so, what is the best approach a counselor can take to help someone change his/her self-talk? My hope was to add to our knowledge about these questions and consequently to help helpers help.



There were 50 women involved in the study, and each woman participated in one of 10 experimental procedures. Rather than detail each separate experience, I will give you the broad results of the study.

First, the assumption that people respond with different emotional reactions to personal than to neutral verbal statements was confirmed. This notion has already received much research support, and I did not view it as a significant or new finding. Second, the more specific theory of the emotional effects of certain kinds of self-talk which I was testing was not confirmed.

Third, there was no clear-cut answer to the best method of changing self-talk. The different methods used in the study were analogs of several counseling approaches--analogs in that they were merely analogous to some counseling techniques and not the techniques themselves. Some of you listened to a tape recording about self-talk, how it affects us, and how we might change it as a way of leading more satisfying lives. Others simply stated certain words while looking at different words on the slide screen. Rather than changing self-talk, this experience was directed at changing the emotional impact of key words. Still others had neither experience but simply rested during an equivalent time period. The results of the study offer no definite findings on which of these several "methods" works best. Finally, the attempt to create emotional arousal by pairing certain words with other, negative words, was unsuccessful.

The lack of findings was disheartening for me. I viewed the study as important, because it was addressed to some significant, practical issues in counseling. The fact that the desired results were not obtained can probably be explained in one of two ways. Either (a) the theory upon which the study was based is inadequate, or (b) my procedures somehow obscured the differences I had hoped to find. Both explanations are probably accurate. One inadequacy of the theory, for example, may be that self-talk isn't limited solely to words, as represented in the study. That is, images and even feelings might also be integral parts of the self-talk which results in an emotional experience. Therefore, tests of this theory may need to provide for imaginal as well as verbal stimuli. The procedure may have broken down in the sentences that were constructed for you to read. Apparently, for some of you, those sentences weren't accurate interpretations of the concerns you had previously identified. For others, the sentences weren't really representative of your thoughts. Consequently, the polygraph was monitoring your responses to something other than what I had anticipated it would. If this was the case, then the theory and the counseling techniques cannot be viewed as having been adequately tested.

Regardless of the present negative findings, your participation in this study will help to channel the efforts of future researchers. As we learn more about human behavior and emotion through research



projects such as this one, we will be in a better position to help people help themselves.

For those of you interested in this general area of psychology, I suggest that you read a book by Albert Ellis and Robert Harper entitled A Guide to Rational Living. I also want to thank you again for cooperating with me in this research effort.

Sincerely,

Steve Elson



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