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EFFECTS OF ASSERTIVENESS TRAINING AND CUE CONTROLLED RELAXATION TRAINING ON CARDIOVASCULAR REACTIVITY TO SOCIAL STRESSORS

by
Bernardine M. Pinto

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
June 1987
The objective of this study was to examine the effects of two interventions (assertiveness training and cue controlled relaxation training) on cardiovascular reactivity to role play simulations of social stressors. For this purpose, a single subject multiple-baseline experimental design was employed. Four subjects (three female and one male) received assertiveness training (which focused on behavioral components of assertiveness) and cue controlled relaxation training. Following assertiveness training, subjects responded assertively to the role plays but their blood pressure reactivity was not reduced. Cue controlled relaxation appeared to reduce blood pressure reactivity to a limited extent. Factors associated with the effects of the two interventions on cardiovascular reactivity are discussed. The results do not support a previous study documenting attenuating effects of assertiveness training on pulse rate reactivity.
ACKNOWLEDGEMENTS

I would like to dedicate this thesis to my family: Pinto, Millerioux, and Pais for their support and encouragement that has made my academic work worthwhile. This one is for you all.

I would like to express my deep appreciation to Dr. R. Wayne Fuqua, my graduate advisor, for his guidance and valuable feedback during the course of this study.

My thanks to everyone else involved in this thesis, particularly, Sue Keller, who spent a summer patiently rating the videotapes.

I am grateful to The Graduate College for financial support for this study, to Dr. R. Wayne Fuqua and the Department of Psychology for the assistantships I have received.

Bernardine M. Pinto
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CHAPTER I

INTRODUCTION

Essential hypertension is a major risk factor for coronary heart disease (CHD), heart failure, and kidney failure (Herd & Weiss, 1984). One out of every six adults in the U.S. has hypertension and in 90% of these cases, a diagnosis of essential hypertension is made because no cause can be identified for the elevated blood pressure (BP). The mechanisms involved in the etiology of essential hypertension are poorly understood. A potential role for psychological stress in the development and/or maintenance of some forms of essential hypertension has been recently suggested (e.g., Obrist, 1981; Weiner, 1979). The processes that mediate between stress and hypertension have not been clearly established, although a number of potential mechanisms have been identified.

Krantz and Manuck (1984) have reviewed the experimental evidence regarding the potential contribution of physiological reactivity to stress to the gradual development of essential hypertension and CHD. Physiological reactivity is defined as "the magnitude of an array of physiological responses to discrete environmental stressors, for example, performing a challenging mental task or exercising strenuously" (Mathews, 1986, p. xi). According to
Obrist (1981), increased cardiac output exhibited under "stress" by highly reactive individuals may, over time, lead to increased resistance in the peripheral vasculature. The transition from early hypertension (characterized by elevated cardiac output) to established hypertension (characterized by increased peripheral resistance) could be mediated by injury to the inner walls of coronary arteries caused by mechanical stress and turbulence in the blood flow or chemically by the release of toxic blood lipids and endocrines (Krantz & Manuck, 1984). Accumulation of smooth muscle cells, lipids and cholesterol in the damaged arteries (atherosclerotic plaque) is believed to contribute to essential hypertension and CHD.

Support for the hypothesized relationship between psychophysiological reactivity and the development of established hypertension comes from a variety of descriptive and retrospective studies. Significant differences have been reported between BP reactivity of hypertensives and normotensives to laboratory stressors such as mental arithmetic (e.g., Brod, Fenc1, Hej1, & Jirka, 1959; Drummond, 1985; Manuck & Proietti, 1982) and the Stroop color-word interference test (e.g., Steptoe, Melville, & Ross, 1984). Investigators have reported an association between cardiovascular reactivity and known CHD risk factors such as family history of CHD and/or hypertension and Type A behavior (e.g., Glass et al., 1980; Jorgensen &
Houston, 1981; Mathews, 1986). In addition, studies have confirmed an association between BP reactivity and the later development of CHD and/or hypertension (e.g., Falkner, Onesti, & Hamstra, 1981; Keys et al., 1971; Wood, Sheps, Elveback, & Scherger, 1984). However, experimental tests of the role of physiological hyperresponsivity in causing essential hypertension are difficult to conduct for a variety of ethical and practical reasons, leading Krantz and Manuck (1984) to state that it would be premature to consider reactivity as an established risk factor. They suggest research on the role of psychophysiological and behavioral influences in the development of essential hypertension.

In accordance with the findings of excessive physiological reactivity to psychological stressors, attempts have been made to modify reactivity to laboratory stressors using psychological treatments. These treatments include relaxation training (e.g., Agras & Jacob, 1979; English & Baker, 1983; Harris et al., 1984), biofeedback training (e.g., Benthem & Glaros, 1982; Steptoe & Ross, 1982) and meditation (e.g., English & Baker, 1983; Puente & Beiman, 1980). These techniques have been found to reduce BP reactivity to laboratory stressors (e.g., Agras & Jacob, 1979; Wadden, Luborsky, Greer, & Crits-Christoph, 1984). Although laboratory stressors such as mental arithmetic and video games can be administered in a
standardized, repeatable manner, these tasks do not approximate stressful situations typically encountered by subjects in everyday life. These differences raise questions about the generality of descriptive and intervention studies using laboratory stressors to reactivity occurring to naturalistic stressors.

Some investigators have studied BP reactivity to socially relevant stressors. Among the naturalistic stressors that have been shown to evoke BP reactivity are role play tasks (e.g., Holroyd & Gorkin, 1983; Twentyman & McFall, 1975), the structured interview (e.g., Dembroski, MacDougall, & Lushene, 1979; MacDougall, Dembroski, Krantz, 1981) and interpersonal games involving competition (e.g., Van Egeren, Abelson, & Thornton, 1978).

Documentation of BP reactivity to socially relevant stressors led to the evaluation of the impact of coping skills training programs on BP reactivity to naturalistic stressors. Ewart, Taylor, Kramer, & Agras (1984) found BP reactivity among hypertensives during disagreements with their spouses. The level of reactivity was attenuated after communication skills training. A combination of relaxation training, problem solving techniques, alteration of tension producing and self-verbalizations were found to reduce BP reactivity to role plays of social stressors (Kallinke, Kulick, & Heim, 1982). The efficacy of the individual components in this treatment package
were not examined. The reactivity attenuating effects of a variation of the standard Progressive Muscle Relaxation (PMR) exercises on BP reactivity to stressful social interactions has also been studied (Fettes, 1986). Subjects were asked to pair covert verbalizations of a cue word (i.e., calm) with relaxing of muscles during PMR training and practice exercises. Relaxation was cued during stressor presentations by repeating the word. This technique called cue controlled relaxation (CCR) was found to reduce BP reactivity to role play simulations of stressful social interactions. These studies suggest that coping skills training could reduce BP reactivity to simulations of naturalistic stressors in the laboratory.

Many stressful social interactions (and laboratory simulations in the form of role plays) require coping skills in the form of assertive responding by subjects. The relevance of assertiveness skills to the attenuation of reactivity has been suggested by several researchers (e.g., Henry & Stephens, 1971; Sapira, Scheib, Mariarty & Shapiro, 1972) as cited in Ewart, Burnett, and Taylor, (1983). Epidemiological data indicate that persons who lack abilities to cope with social stress (e.g., attack or avoid an angry boss) may be at greater risk for developing high blood pressure (Harburg, Blakelock, & Roeper, 1979). Kean et al. (1982) found that hypertensives responded less assertively (on dimensions such as latency of response,
compliance and request for behavior change) than non-patient comparison subjects in role plays of stressful interactions. Morrison, Bellack, and Manuck (1985) found elevated BP during role plays among hypertensive subjects who showed inappropriate submissiveness or inappropriate assertiveness during role play stressors.

Although a behavioral technology for assertiveness training (AT) has been developed and applied by a number of investigators (see Galassi & Galassi, 1978; Hersen, Eisler & Miller, 1973; for reviews), the impact of assertiveness training on BP reactivity to stressful interactions has seldom been evaluated. In one of the few studies of the effects of AT on reactivity, McFall and Marston (1970), monitored subjects' pulse rates prior and subsequent to exposure to a battery of role play stressors. Subjects who received behavioral rehearsal AT showed a decrease in pulse rate reactivity (as compared to pre-stressor levels). No treatment waiting list control subjects showed an increase in pulse rate following the role plays. However, pulse rate readings were not taken during the presentation of role play stressors. Further, the role play stimuli were presented via audiotapes and this may not be representative of face to face stressful interactions that subjects typically encounter in everyday life. Unfortunately, research on the effects of AT on BP reactivity has yet to be reported.
Using clients who exhibit an assertiveness deficit and BP reactivity to vignettes requiring assertive responding, this study attempted to assess the relative effects of AT and CCR training on BP reactivity to social stressors. This study extends prior research by: (a) using socially relevant stressors (role plays), (b) using subjects with assertiveness deficit and BP reactivity to social stress, and (c) comparing the relative efficacy of AT and CCR training on the level of BP reactivity. Results could provide information for guiding the selection between two alternative interventions for BP reactivity (i.e., AT vs. CCR training) based on the individual's source of stress.
CHAPTER II

METHOD

Subjects

Thirteen subjects were recruited, by means of flyers posted around the university campus, requesting voluntary participation of clients who wished to learn assertiveness skills. Subjects were selected on the basis of a screening session that required subjects to respond assertively to three role plays. Selection criteria included: (a) an average of 10% increase in systolic blood pressure (SBP) and diastolic blood pressure (DBP) during laboratory analogs of social stressors, and (b) assertiveness deficit as assessed by performance in the role plays.

Assertiveness deficit was assessed from videotapes of the screening session which were rated for the following six components of assertiveness: latency, loudness of tone, speech disturbances, statement of the problem, noncompliance, and requests for behavior change. General procedures, definitions of each component and scoring procedures are described in Behavioral Components of Assertiveness and Scoring sections.

The subject could conceivably display all six components in each role play (total of 18 for three role plays...
in the session). Subjects who displayed seven or fewer components in the session were considered to exhibit assertiveness deficit.

The four subjects (3 female and 1 male, mean age = 24 years) who met both criteria, signed informed consent forms and attained medical clearance from their respective physicians, participated in the study. None of the subjects were receiving antihypertensive medication. Their resting BP levels ranged from 94-120 mm Hg. SBP and 70 to 91 mm Hg. DBP. None of the subjects had previously received formal assertiveness training. Subjects were paid $2.00 per experimental session with a bonus of $1.00 per session. The bonus was paid after the completion of the study.

Setting

All experimental sessions were conducted in a room equipped with physiological monitoring equipment and a one-way vision screen. An Olympus videotape camera (model VX 304) on a tripod, was located in an adjoining room behind the one-way mirror.

Apparatus/Materials

SBP, DBP and heart rate were monitored using the Carolina Digital Self-inflating Sphygmomanometer model 69-1118, located in a partitioned area of the experimental
room. The monitoring cuff was placed about 1-2 cm above the elbow joint of the subject's left arm. BP and heart rate readings were displayed digitally following each BP determination.

Muscle tension levels (EMG) and electrodermal activity (EDG) were recorded using the J & J EMG model M-52 and J & J EDG model R-72. The EMG electrodes were placed parallel to the frontalis muscle of the forehead, attached to adhesive discs with electrode paste. The EDG electrodes were placed on the tips of the middle and index fingers of the nondominant hand. Readings were displayed digitally on the digital integrator unit J & J Dual Integrator unit model D-200.

Subjects were requested to complete an intake form (in the screening session) on which they described their medical history, current medications, consumption of alcohol, caffeine and nicotine, and weekly exercise. A similar form was given to the subjects after their final experimental session and at each follow-up session to assess any change in medication, diet and exercise. The Assertion Inventory (Gambrill & Richey, 1975) and the Rathus Assertiveness Schedule (Rathus, 1973) were completed by each subject at the screening session and after the second follow-up session.
Construction of Stimuli

Twenty-six vignettes that represented potentially stressful interactions and required assertive responding were developed. Their content was similar to vignettes described by Eisler, Hersen, Miller, and Blanchard (1975). The vignettes depicted interactions from four relationship categories: (a) with an immediate family member, (b) with friends and acquaintances, (c) with colleagues and others at work, and (d) with strangers.

The role plays based on the vignettes met the following criteria: (a) maximum duration of each role play was 3 minutes; (b) role plays involved interactions with a variety of social partners; and (c) role plays involved expression of anger, refusal of requests, standing up for one's rights and making requests. Information on each vignette was printed on an index card that included a description of the setting, the role player's behavior and a prompt to either initiate a verbal interaction or to respond to an interaction initiated by the role player.

For example, a representative vignette was as follows:

You have had a very busy day at work and you are tired. Your boss comes in and asks you to stay late for the third time this week. You really feel you would like to go home on time tonight. Respond to your boss' request.

Three individualized vignettes were constructed on the basis of an interview with each subject during the
screening session. These vignettes were similar to interac­tions which the subject identified as stressful in his/her current life circumstances and the vignettes required assertive responding.

Safeguards

Because the vignettes depicted stressful interactions that were similar to those that occur in everyday situations, subjects were not exposed to risks above and beyond those typically encountered in daily living. As an additional safeguard, the experimenter conducting the sessions was trained in cardiac pulmonary resuscitation.

Selection and Training of Role Players

Role players (2 male, 3 female) with acting skills were recruited by flyers posted around the campus. They were trained with sample vignettes of the role play stressors. In an effort to standardize the "difficulty" of a vignette across repeated presentations, the role players were provided with a script containing a selection of appropriate verbal and non-verbal responses for each role play situation. For example, in playing the role of the employer asking the employee (the subject) to work late for the third time in a week, the role player was instructed to frown, raise the tone of voice and use specific statements such as "It is a matter of loyalty to the
company. No one else complains about working overtime." Training was terminated when the role player displayed at least two nonverbal and two verbal responses from the script for each vignette. The role players were instructed to personalize the interactions by using the subject's name.

Procedure

General Procedure

In the screening session, baseline sessions, post-training sessions (post-At and post-CCR sessions) and follow-up sessions, subjects were exposed to rest and stressor periods during which SBP, DBP, heart rate, EMG and EDG responses were monitored. The sessions began with a 5 minute adaptation period, followed by 5 minute rest, a role play for 3 minutes, and a rest period for 5 minutes. The second role play (involving a different vignette) followed for 3 minutes, and a rest period of 5 minutes and finally the third vignette was presented (3 minutes).

The experimenter read the following instructions to the subject at the start of the adaptation period: "During this period, you should sit quietly and relax. I will occasionally take readings during this phase but I cannot talk to you or answer questions until the completion of this experimental session."

BP and heart rate readings were recorded by the
experimenter at 2 minute intervals during the 5 minute adaptation and during the 5 minute rest periods. BP and heart rate readings were taken at the first and third minute during each role play. EMG and EDG readings were recorded in repeat cycles of 2 minutes throughout the session. In an effort to avoid physiological habituation to repeated presentation of specific vignettes, at least two of the three vignettes in each experimental session were novel to that subject.

**Baseline Sessions**

The general procedure and monitoring of physiological responses in the baseline sessions have been described in the General Procedure section. Before each role play, subjects received the following instructions:

*During this period, I will read a description of a potentially stressful interaction with [role player's name]. Please respond as you typically would in such a situation. I am interested in your typical response patterns and not in your acting ability. Begin the interaction when I say "start" and continue interacting with [role player's name] until I ask you to stop. I will occasionally take readings during this phase.*

At the end of the session, subjects completed a Client Feedback Form (this form is described in the Self-report Measures section.)

**Post-AT Phase**

Following AT, the effects of the intervention were
assessed in three postintervention sessions. Sessions during this phase were conducted as described in the General Procedure section with two exceptions. Before each role play, subjects were given the following instructions:

In the following interaction, try to control your blood pressure by using the assertiveness skills in the manner you have been taught in training. As before, begin the interaction when I say "start" and continue interacting with (role player's name) until I ask you to stop.

At the end of the session, subjects were asked to rate the extent to which they had used the assertiveness skills on a 5-point scale. Objective measures of assertiveness skills were obtained later from videotapes of the role plays.

Post-CCR Phase

Three postintervention sessions followed CCR training using the procedures as described in the General Procedure section with two exceptions. Prior to each role play, subjects received the following instructions:

In the following role play, try to relax and control your BP by using the relaxation skills you have been taught. In order that I can tell whether you are using the skills, I would like you to say calm aloud (verbal cue word associated with a relaxed state) at least twice during the role play. You could say calm when the role player is speaking and you are otherwise silent.

All the subjects received AT and CCR training.

Following the second intervention, subjects received
instructions to use assertiveness skills and relaxation skills to control their BP during the role plays (i.e., the instructions given to the subjects prior to the role plays as described in the post-AT phase and post-CCR phases were combined).

**Generalization of Training**

One individual and one general vignette which were associated with the highest BP reactivity during baseline sessions for each subject were never involved in AT. These two vignettes were presented to the subject during postintervention phases (along with other role plays) to assess generalization of training effects.

**Follow-up Sessions**

Follow-up sessions at 8 and 12 weeks after the last experimental session were similar in procedure and data recording to the postintervention sessions. Subjects were instructed to use the assertiveness and relaxation skills to control their BP during the role plays. Changes in diet, exercise and medication were noted in information forms completed by the subjects at the start of each follow-up session.
Dependent Variables

Physiological Responses

SBP, DBP, EMG, EDG and heart rate were recorded during the alternating rest and stress periods in each experimental session. EMG and EDG were also recorded during CCR training as a means of assessing relaxation levels. To assess physiological reactivity, the average of physiological readings was calculated separately for the rest and stress periods within each session. From these calculations, absolute change (mean stress minus mean rest levels) and percentage change (mean stress/mean rest x 100%) scores for SBP, DBP, heart rate, EMG and EDG were calculated for each session.

Behavioral Components of Assertiveness

The subject's performance during the three role play interactions in each session were videotaped and scored at a later time by the primary observer and reliability observer for the following verbal and nonverbal characteristics of assertiveness:

1. Latency of response (in seconds): the time between the "start" signal or the role player's opening statement and the emission of a clear vocalization of at least three words.

2. Duration of response (in seconds): total
duration of the subject's vocalizations during the role play.

3. Speech disturbances: such as stutters, expletives (e.g., "ah," "um," etc.)

4. Gestures: hand or arm movements that resulted in loss of contact between the hand or arm with either the body or chair.

5. Statement of the problem: clear statement indicating the existence of a problem situation.

6. Verbal noncompliance: statement expressing noncompliance with the role player's unreasonable behavior or suggestion (e.g., "No, I'm not willing to do that.").

7. Request for behavior change: a clear request for behavior change on the part of the role player or an alternative solution to the problem suggested by the subject.

Fifteen second intervals were used to record the occurrence of gestures, speech disturbances, statement of the problem, noncompliance and requests.

The primary observer rated the subject's performance for: (a) affect, (b) loudness, and (c) overall assertiveness. Five-point ratings scales were used for this purpose (see Appendix A for the representative Behavior Rating Form). On the affect scale, a rating of 1 represented extreme passivity and unconvincing responses, while a rating of 5 was given if the responses were firm and
convincing. For loudness of tone, a rating of 1 indicated very low, inaudible speech and a rating of 5 was given for appropriately loud and clear responses. On the scale for overall assertiveness, the subject received a rating of 1 for very unassertive behavior and a rating of 5 for appropriate assertive behavior.

**Scoring**

The scores obtained on each role play were averaged across the three role play vignettes to yield an average for each of the behavioral components of assertiveness for that session.

**Self-report Measures**

At the end of each experimental session, subjects completed the Client Feedback Form (see Appendix B). A rating on a 5-point scale was obtained for the level of stress associated with each of the three role plays. Five-point scales were also used to determine the extent to which the subject's responses to each role play were typical of responses in the natural environment. Following AT, the last set of scales was replaced by 5-point scales to assess the extent to which the subject estimated that he/she had used the assertiveness skills in each role play (self-report of assertiveness level).
Observer Training

The primary observer and the reliability observer were graduate students in psychology and had received training with sample videotapes of interactions. During training, the trainer and observers rated the sample role plays for the behavioral components of assertiveness. After nine hours of training, the observers independently rated two sample session videotapes. Interobserver agreement indices were calculated for each behavioral component. The indices obtained were 80% and above and these indices fulfilled the criterion for terminating training. The observers were blind as to the order of the sessions and the experimental phases for each subject. In an effort to reduce bias, the videotapes of the session for each subject alternated with videotaped sessions of the other subjects.

Interobserver Agreement

Indices of interobserver agreement for the behavioral components of assertiveness were calculated for 25% of the sessions scored by the primary observer. For latency and duration measures, interobserver agreement was obtained by dividing the smaller estimate by the larger estimate. The ratios obtained were summed across role plays and an average index of interobserver agreement was obtained.

For gestures and speech disturbances, an agreement
percentage was calculated for each 15 second interval by dividing the smaller number by the larger number of scored occurrences within the interval. Exact agreement on the number of responses in an interval including intervals in which neither observer scored a response, represented 100% agreement for that interval. The within interval agreement percentages were averaged across all intervals for that session to yield separate average agreement percentages for gestures and speech disturbances for each session.

For the verbal content components (i.e., statement of the problem, noncompliance and requests), an agreement percentage was calculated for each 15 second interval, by dividing the smaller number by the larger number of scored occurrences within the interval. These calculations were determined for intervals in which, at least, one observer had recorded occurrence of the behavior component. Intervals in which neither observer scored an occurrence were omitted from the calculations. The within interval agreement percentages were averaged across all intervals for that session to yield average agreement percentages for each dependent variable for each session (see Table 1). All the indices indicate moderately high levels of inter-observer agreement.
Table 1

Indices of Interobserver Agreement for Behavioral Components of Assertiveness

<table>
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<th>Components</th>
<th>% Agreement</th>
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<td>Latency</td>
<td>88</td>
</tr>
<tr>
<td>Duration</td>
<td>84</td>
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<tr>
<td>Speech disturbances</td>
<td>80</td>
</tr>
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<td>Gestures</td>
<td>86</td>
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<td>Loudness</td>
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<td>Affect</td>
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<td>Problem statement - occurrence</td>
<td>92</td>
</tr>
<tr>
<td>Problem statement - nonoccurrence</td>
<td>96</td>
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<tr>
<td>Noncompliance - occurrence</td>
<td>81</td>
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<td>Noncompliance - nonoccurrence</td>
<td>93</td>
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<tr>
<td>Requests - occurrence</td>
<td>74</td>
</tr>
<tr>
<td>Requests - nonoccurrence</td>
<td>96</td>
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Because the verbal content components did not occur in some role play interactions, interobserver agreement percentages were determined separately for nonoccurrence of the verbal content components. For each 15 second interval in which at least one observer recorded nonoccurrence of the dependent variable, agreement percentages for nonoccurrence were determined. When both observers recorded nonoccurrence of behavior in an
interval, the agreement percentage was 100% for that interval. When one observer recorded nonoccurrence, while the other observer recorded one or more occurrences of the behavior in an interval, the smaller estimate was divided by the larger to yield an agreement percentage. The agreement percentages were averaged across intervals to yield average agreement percentages for nonoccurrence of each verbal content component for each session (see Table 1).

Reliability of ratings for affect, loudness and overall assertiveness were obtained by dividing the number of agreements by the total number of judgments (agreement was defined as +/- one rating point deviation).

Independent Variables

Assertiveness Training (AT)

The primary independent variables were AT and CCR training. AT was conducted in four one-hour sessions for each subject. The training began with a brief description of assertive behavior as distinguished from passive and aggressive responses. Subjects received training on two general and two individualized vignettes. The four vignettes were rated by the subject on a 1-100 point scale of anxiety arousal (100 = highest anxiety arousal).

The vignette associated with the least anxiety was first selected for training. The subject was given index
cards listing the assertive components described in the Behavioral Components of Assertiveness section. Training focused first on latency of response, then statement of the problem, noncompliance, requests for behavior change, gestures, speech disturbances and finally, speech duration.

The subject was instructed to note a specific component (listed on an index card) while viewing a model videotape of an actor/actress interacting assertively in the selected role play situation. After viewing the videotape, the subject was asked to attempt to use the specific component in a rehearsal of the role play. The subject interacted with the experimenter in the rehearsals (the experimenter assumed the role player's role). Following the rehearsal, the experimenter provided feedback on the occurrence (or nonoccurrence) of the component (verbal content components) and gave suggestions for improvement. The rehearsals and feedback continued until the component was clearly displayed by the subject in the rehearsal.

For gestures, subjects were asked to keep unrelated, excessive gestures to a minimum. Rehearsals and feedback for this component were terminated when fewer than 10 gestures occurred during the rehearsal. For speech disturbances, subjects were asked to reduce the frequency of their occurrence. Training was terminated when fewer than 10 speech disturbances occurred during rehearsals.
Finally, subjects were asked to verbalize the problem statement, noncompliance and requests for behavior change fully in an attempt to increase speech duration. A specific criterion was not established for termination of training for this component. When the subject was able to state the verbal content components and respond fully to the experimenter's prompts during rehearsal, training was terminated for this component. When the training for all the components met criteria, the training session ended.

Each training session focused only on a single vignette. The vignette associated with the next higher anxiety level was selected for training. The same training procedure was adopted for all four vignettes selected for training. These vignettes were not presented to the subject in the post-AT, post-CCR and follow-up sessions.

**Cue Controlled Relaxation (CCR) Training**

Each subject participated in a progressive muscle relaxation training session based on the progressive muscle exercises described by Bernstein and Borkovec (1973). EMG and EDG levels were monitored during the session to assess relaxation levels. The trainer said the verbal cue word (calm) aloud while instructing subjects to relax their muscles and also instructed subjects to say the cue word to themselves while relaxing. Training was terminated when: (a) EMG levels (recorded from the
frontalis muscle) were below 3 microvolts after the muscle exercises were completed (Budzynski, 1973; Stovya, 1979); and (b) Subjects reported reduced muscle tension. This criterion was achieved by asking subjects to report muscle tension levels on a 1-100 point rating scale (0 = minimum tension) before the muscle exercises and after the exercises were completed. All the subject reported reduced tension levels (relative to their tension rating prior to training).

Following training, subjects were given three audio-tapes that presented progressively shorter relaxation exercises (and autogenic imagery). The tapes presented the cue word (calm) at appropriate points and subjects were instructed to say this word as well. The subjects were asked to practice relaxation at home by listening to each tape at least once; and were encouraged to do so more than once. They were provided with forms on which they recorded pre- and post practice tension levels (on a 1-100 point scale) and noted the secret word embedded at some point in each tape. This latter component was added to ensure that subjects completed the assignment. With the exception of one subject, the assigned practice was completed in a week. All the subjects recorded the correct secret word embedded in each tape.
Experimental Design

Because of individual differences in physiological reactivity and individualized stressors, group designs were deemed inappropriate for the evaluation of the effects of AT and CCR training on BP reactivity. A single subject design, a multiple baseline across subjects was used in this study. In order to detect sequence effects of the two interventions, two subjects (randomly selected) received AT first followed by CCR training. The training sequence was reversed for the other two subjects. The total number of sessions for each subject ranged from 15-17 with follow-up sessions at 8 and 12 weeks after the final experimental session. After each intervention, the effects of training on BP reactivity, heart rate, EMG, EDG and behavioral components of assertiveness were assessed.
CHAPTER III

RESULTS

Graphic Analysis

Figure 1 displays mean SBP and DBP levels during rest and stress periods across experimental sessions for all subjects. The baseline data show considerable between-subject variability. There was a decrease in BP reactivity following the first baseline session indicating some physiological habituation to the stressors. However, reactivity did not totally drop out. Figure 2 shows the mean changes in SBP and DBP reactivity from rest to stressor periods (mean stress minus mean rest) across phases for each subject. The data suggest that changes in resting BP levels and/or reactivity occurred following the interventions which were introduced after a varying number of baseline sessions as prescribed by the multiple baseline across subjects design.

Figures 3, 4, 5, and 6 represent the behavioral components of assertiveness displayed by each subject across sessions. Latency of response was not represented because the latencies were below one second for all the sessions for each subject. There was considerable variability in the other behavioral components of
Figure I. Mean Systolic and Diastolic Blood Pressure Levels During Rest and Stress Periods Across Experimental Sessions. In all cases, the top pairs of data points represent Systolic Blood Pressure, while the bottom pairs represent Diastolic Blood Pressure.

Legend. ● = Resting Levels, AT = Assertiveness Training, ○ = Stress Levels, CCR = Cue Controlled Relaxation Training.
Figure 2. Mean Changes in Blood Pressure From Rest to Stressor Periods Across Phases by Subject.
assertiveness across and within subjects. In particular, gestures varied across sessions for each subject (SD range from 0.58 to 44.71) and therefore, the data were not graphically represented. Generally, following AT, verbal content components and ratings for loudness of tone, affect and overall assertiveness increased.

Subject 1

Behavioral Measures of Assertiveness

Figure 3 graphically represents the behavioral components of assertiveness assessed across phases for this subject. These data support the following conclusions:

1. There was considerable within-subject variability for all components in the baseline.
2. Following AT, all the verbal content components increased (i.e., problem statement, noncompliance and requests) initially and then declined. Following CCR training, the verbal content components stabilized at a higher level than at baseline.
3. Affect and overall assertiveness ratings increased following AT and these increases were maintained following CCR. Ratings at follow-up sessions were typically higher than at baseline.
4. AT did not appear to produce consistent effects on loudness of tone and duration of responses. The mean response duration increased after AT and declined.
Legend. AT = Assertiveness Training, CCR = Cue Controlled Relaxation Training

Figure 3. Behavioral Components of Assertiveness Across Sessions for Subject 1.
5. Speech disturbances decreased after AT and this reduction was maintained in the post-CCR phase and at the first follow-up session.

Cardiovascular Reactivity

Examining the data for each subject individually, it appears that Subject 1 (Figures 1 and 2) showed an increase in SBP reactivity (relative to baseline) and a marked increase in DBP reactivity following AT. After CCR training, average SBP and average DBP reactivity decreased relative to the post-AT phase. Follow-up data reveal no effects of training on BP reactivity as compared to baseline.

In summary, it appears that while the subject displayed more assertiveness (as defined in terms of behavioral components), BP reactivity increased following AT. After CCR training, reactivity returned to baseline levels while behavioral measures of assertiveness stabilized at higher levels than at baseline.

Subject 2

Behavioral Measures of Assertiveness

Figure 4 represents the behavioral components of assertiveness for the subject across phases. From the data, the following observations can be made.
Legend.  AT = Assertiveness Training, CCR = Cue Controlled Relaxation Training

Figure 4. Behavioral Components of Assertiveness Across Sessions for Subject 2.

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1. There was considerable variability of components in the baseline.

2. No clear trend in verbal content components can be distinguished following either of the two interventions. An inverse relation between mean occurrences of noncompliance and requests was observed across all phases. Problem statement and noncompliance was markedly greater at the follow-ups as compared to baseline.

3. Affect and overall assertiveness ratings increased following AT and these effects were maintained in the post-CCR phase and at follow-ups. Ratings of loudness varied inconsistently across phases.

**Cardiovascular Reactivity**

As depicted in Figure 1, Subject 2 showed marked variability in resting BP levels during baseline. Resting BP levels increased, average SBP and DBP reactivity decreased in the post-AT phase (Figure 2). In the post-CCR phase, there was a decrease in resting BP levels and in reactivity: BP levels were higher during rest than stress periods. These effects were also found at follow-up sessions: there was a little or no reactivity. It appears that CCR training was more effective than AT in attenuating BP reactivity for this subject.

It appears that while two verbal content components, affect and overall assertiveness increased following AT,
this intervention did not produce any consistent changes in other behavioral components of assertiveness. BP reactivity decreased after AT. However, in the post-CCR training phase, there were reductions in SBP and DBP reactivity and maintenance of the increases in problem statement, affect and overall assertiveness.

Subject 3

Behavioral Measures of Assertiveness

Figure 5 represents the behavioral components of assertiveness displayed by this subject across phases. The following observations can be made.

1. Baseline data show variability.

2. Verbal content measures continued to show variability across phases and no clear trends can be identified: these data are similar to those of Subject 2. Again, noncompliance and requests were found to vary inversely. At follow-ups, mean frequency of noncompliance was markedly greater than at baseline.

3. Ratings of loudness showed an increasing trend in each phase. Ratings of affect and overall assertiveness were higher following AT relative to baseline and post-CCR sessions.

4. Speech disfluencies decreased after AT and this reduction was maintained at follow-up sessions.
Legend. AT = Assertiveness Training, CCR = Cue Controlled Relaxation Training

Figure 5. Behavioral Components of Assertiveness Across Sessions for Subject 3.
Cardiovascular Reactivity

From the data displayed in Figures 1 and 2, in the post-CCR phase, there was a reduction in BP reactivity and resting BP levels stabilized. In the post-AT phase, average SBP and DBP reactivity increased. Follow-up data show no reductions in reactivity relative to baseline.

For this subject, CCR training was followed by a reduction in average BP reactivity and AT appeared to produce an increase in CV reactivity particularly in the sessions immediately following training. However, noncompliance, affect and overall assertiveness increased in the post-AT phase and these changes were accompanied by a decrease in speech disfluencies.

Subject 4

Behavioral Measures of Assertiveness

Figure 6 represents the behavioral components of assertiveness assessed across phases. The results indicate that:

1. Verbal content components measures increased in the first post-CCR session but declined thereafter.

2. Noncompliance and requests increased sharply following AT but these effects were not consistently maintained. Mean occurrence of the verbal content components particularly noncompliance were typically higher at
Figure 6. Behavioral Components of Assertiveness Across Sessions for Subject 4.
follow-ups than at baseline.

3. Affect and overall assertiveness stabilized at a higher level following AT relative to baseline and post-CCR training phase.

4. Mean duration of responses and percentage of speech disturbances showed considerable variability across phases.

**Cardiovascular Reactivity**

As displayed in Figure 1, Subject 4 showed considerable SBP reactivity during the baseline while DBP reactivity was low. Resting BP levels were greater than BP levels during stress in the first post-CCR session: DBP reactivity remained low thereafter (Figure 2). Following AT, average SBP reactivity decreased and there was little DBP reactivity. Average SBP and DBP reactivity increased at both follow-up sessions. These data suggest that CCR training reduced BP reactivity and the reductions were maintained following AT.

In summary, BP reactivity was fairly low following CCR training and these attenuating effects were well maintained in the post-AT phase. Low BP reactivity was accompanied by increases in noncompliance, affect and overall assertiveness following AT.
Generalization Measures

BP reactivity and assertive responses to the generalization vignettes varied across subjects and across phases (selection of these vignettes is described in the Generalization of Training section). Subject 1 showed an increase in loudness, affect, overall assertiveness and the verbal content components of assertiveness on the generalization vignettes. While the absolute BP reactivity declined on the presentation of these vignettes in the post-CCR phase and in the follow-up sessions, assertive responding declined to levels higher than at baseline. Subject 2 showed an increase in assertive responding to the two vignettes in the post-AT phase, and the increases were maintained in the post-CCR phase and follow-up sessions. Absolute BP reactivity to these vignettes declined over phases. Subject 3 showed an increase in assertive responses to both vignettes in the post-AT phase, with a decline in BP reactivity for one vignette and an increase in BP reactivity for the other vignette. Subject 4 showed an increase in loudness of tone, affect, overall assertiveness and verbal content components of assertiveness to both generalization vignettes. Absolute BP reactivity to these vignettes declined over the phases.

Statistical Analysis

Table 2 shows the stress and rest period means (and
Table 2
Stress and Rest Period Means (and Standard Deviations) for all Physiological Measures by Subject

<table>
<thead>
<tr>
<th>Subject</th>
<th>Measure</th>
<th>Period</th>
<th>Baseline</th>
<th>Post-AT</th>
<th>Post-CCR</th>
<th>Follow-up</th>
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<td></td>
<td>SBP (mmHg)</td>
<td></td>
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</tr>
<tr>
<td>1</td>
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<td>116 (4.04)</td>
<td>114 (4.36)</td>
<td>119 (7.07)</td>
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<td></td>
<td>DBP (mmHg)</td>
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<td>Post-CCR</td>
<td>Follow-up</td>
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<td>EMG (uV)</td>
<td>Rest</td>
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<td>5.8 (0.32)</td>
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<td>6.9 (4.9)</td>
<td>4.8 (0.55)</td>
<td>2.9 (0.28)</td>
</tr>
</tbody>
</table>

Legend.  
SBP = Systolic Blood Pressure  
EDG = Electrodermal Response  
HR = Heart Rate  
DBP = Diastolic Blood Pressure  
EMG = Electromyographic Response
standard deviations) for all physiological measures across phases for each subject. These results indicate: (a) Increase in SBP and DBP reactivity following AT for Subject 1; (b) Higher resting SMT and DBP levels as compared to stress levels, following CCR for Subject 2; (c) Increased SBP and DBP reactivity following AT (as compared to post-CCR phase) for Subject 3, and (d) A decrease in SBP reactivity following AT for Subject 4.

Univariate repeated measures analysis of variance were conducted on the absolute change values between mean stress and mean rest measures (mean stress minus mean rest) for each phase for each subject. Statistical analysis of the data revealed no significant effects of AT and/or CCR training on absolute change values for all physiological measures (SBP, DBP, heart rate, EMG and EDG). No significant main treatment effects were found. These nonsignificant results could be due to the small sample size and high between subject variability.

Self-Report Measures

Participant Information Form

Subjects typically reported only small changes in the following areas from the onset of the study to the conclusion: caffeine, alcohol and sodium consumption; exercise, stressfullness of every day life and weight (+ or - 5 lbs.). All subjects were nonusers of tobacco throughout
the course of the study.

Satisfaction Survey

Appendix C presents the post experiment satisfaction survey administered at the conclusion of the study and the mean responses across subjects. Responses given at the end of the study were not largely different from responses given at either of the two follow-up sessions. The subjects were satisfied with their participation in the study (mean rating of 4.5 on a 5-point scale). Self-report indicates that CCR and assertiveness skills were used frequently (mean rating of 3.5 and 4.5 respectively on a 5-point scale).

Rathus Assertiveness Schedule (RAS)

Pre- and post scores on the RAS for subjects 1 and 2 showed a shift from the nonassertive to the assertive range. Pre- and post scores for Subject 3 scores remained in the nonassertive range. Subject 4 showed a slight shift in pre- and post assertiveness scores: both remained in the assertive range (see Table 3).
Table 3
Pre- and Post Scores on the Rathus Assertiveness Schedule (RAS) and the Assertiveness Inventory (AI)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Assessment</th>
<th>RAS Discomfort</th>
<th>AI Discomfort</th>
<th>Response Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-</td>
<td>-31</td>
<td>120</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>+20</td>
<td>72</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Pre-</td>
<td>-16</td>
<td>137</td>
<td>118</td>
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<tr>
<td></td>
<td>Post</td>
<td>+7</td>
<td>77</td>
<td>115</td>
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<tr>
<td>3</td>
<td>Pre-</td>
<td>-49</td>
<td>142</td>
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<td>Post</td>
<td>-42</td>
<td>138</td>
<td>156</td>
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<tr>
<td>4</td>
<td>Pre-</td>
<td>+37</td>
<td>68</td>
<td>82</td>
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<td></td>
<td>Post</td>
<td>+32</td>
<td>69</td>
<td>94</td>
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</table>

**Assertiveness Inventory (AI)**

Pre- and post scores on the AI for Subject 1 (discomfort and response probability scores) and discomfort scores for Subject 2 shifted from the nonassertive to the assertive range. Pre- and post scores for Subject 3 remained in the nonassertive range. Subject 4 showed a slight change in pre and post scores (discomfort and response probability); his scores remained in the assertive range (see Table 3).
Self-Report of Assertiveness

Mean self-reports of assertiveness were obtained from each subject in the post-AT phase. These reports were based on the responses on the Client Feedback Form completed at the end of the experimental sessions in the post-AT phase. Correlations were obtained between mean self-reports of assertiveness and the mean ratings of overall assertiveness as scored by the primary observer for the same sessions. Pearson product moment correlations ranged from -0.15 (Subject 4) to +0.89 (Subject 3).

Subject 1 tended to overestimate assertiveness level of her responses during the stressors while Subject 4 underestimated his assertiveness level (relative to observer ratings of overall assertiveness).
CHAPTER IV

DISCUSSION

This study attempted to assess the relative effects of AT and CCR training on BP reactivity to laboratory simulations of social interactions. Such simulations are more representative of naturalistic stressors than tasks such as mental arithmetic and typically require assertive responding by subjects. AT did increase verbal content components of assertiveness, loudness, affect and overall assertiveness. When AT was the first intervention, such behavior changes were accompanied by increases in average SBP and DBP reactivity for one subject, and decreases in BP reactivity for the other subject. CCR training reduced average BP reactivity for both subjects. When CCR training was the first intervention, the training did not contribute to improved assertive responding, but there was a decrease in average SBP and DBP reactivity. When this training was followed by AT, there were moderate increases in assertiveness; average BP reactivity increased for one subject while there was a further decrease in average BP reactivity for the other subject.

BP reactivity was not attenuated following AT for two subjects. Several factors in the post-AT session merit consideration while examining these results.
1. In the post-AT phase, prior to the role play stressors, subjects received instructions to use the assertiveness skills to control BP. This requirement to use the behavioral components of assertiveness could have been stressful, limiting any reactivity attenuating effects.

2. AT focussed on behavioral components only. Negative self-statements such as "I'm an awful person to turn him/her down," may have occurred while the subject was responding to the role player. The use of such covert negative self-verbalizations even as the subject was responding assertively in the role play could contribute to BP reactivity.

3. Subjects were encouraged to use AT skills in stressful social interactions that occurred in their daily lives. Whether prolonged practice might result in a gradual reduction of reactivity to stressful situations was not assessed herein and merits further study.

The increase in assertive responding was substantial in the first post-AT session, assertive responding declined subsequently and stabilized at levels higher than baseline. The partial lack of maintenance of assertive responding could be the result of several factors. First, behavior rehearsal in AT involved interactions with the experimenter. It is possible that such rehearsals may not have been representative of interactions with the role
player (although, the role player's script was used by the experimenter during rehearsals). Second, AT in this study was relatively brief comprising four one-hour training sessions. McFall and Marston (1970) also conducted four one-hour behavior rehearsal training sessions and reduction in pulse rate following stressors in the post-AT have been reported. These contradictory results could be related to variation in the assessment procedures across the experiments. Pulse rate readings were not recorded during the stressors (McFall & Marston, 1970) and subjects were required to respond to tape recorded stimulus situations. In contrast, in this study, physiological readings were taken during the stressors and the obtained readings were compared to physiological data obtained during rest periods. Further, subjects were required to interact with a role player for 3 minutes during each role play. Thirdly, in order to maintain consistency in the stress associated with the role play vignettes across sessions, role players did not acquiesce to the alternative solutions to the problem situations as suggested by the subjects. Even while the subjects were responding assertively, they did not achieve resolution of the problem situation. This lack of reinforcement for appropriate responding could have contributed to the decline in assertive responses after the first post-AT session.

The limited effectiveness of CCR training on BP
reactivity in this study merits further examination. Factors that may account for these results include:

1. Relatively brief training supplemented by practice at home using audiotapes. Some researchers have reported reductions in BP reactivity to psychological stress following very brief (one session or less) relaxation training (Steptoe & Greer, 1980). Future research on CCR may address the issue of adequacy of training.

2. There was no physiological evidence for muscle relaxation during the role plays in the post-CCR phase. Although the criterion of frontalis EMG levels of 3 microvolts had been achieved during CCR training, EMG readings were above 3 microvolts during the stressor periods in the post-CCR sessions.

3. Subjects had been instructed to say the cue word calm aloud at least twice during each role play in post-CCR sessions. This requirement ensured application of one component of the CCR skills but may have functioned to distract subjects from the task and the performance of the assertiveness skills. After receiving AT and CCR training, subjects were asked to use the assertiveness skills and say the cue work calm aloud during the stressors. These task requirements may have limited reactivity attenuating effects of the two interventions.

A final point to note considering the lack of significant reductions in BP reactivity following AT and CCR
among normotensive subjects. Generally, larger blood pressure declines are observed in subjects with higher baseline pressures; those with lower levels show less dramatic decrements (Shapiro, Schwartz, Ferguson, Redmond & Weiss, 1977). The "physiological floor" may limit attempts to obtain significant reductions in SBP and DBP reactivity among normotensives using coping skills training.
Appendix A

Behavior Rating Form
BEHAVIOR RATING FORM

CLIENT 3:  SESSION:  ROLE PLAY:

SPEECH CHARACTERISTICS

Duration of client's responses: for pauses greater than 3 secs., terminate timing and begin recording when client begins speaking again:

Total duration of role play: % response duration of role play:

Loudness of speech

very low, inaudible

1  2  3  4  5

appropriate loudness & clarity

Number of speech disturbances: stutters, expletives such as ah, um, you know, I mean, well, etc.

1  2  3  4  5  6  7  8  9  10  11  12

15 sec. intervals

Total:

Ratio of speech disturbances to duration of response:

Nonverbal behavior

Gestures: hand or arm movements which result in loss of contact with body or chair. Do not record movements such as scratching, finger tapping, etc. which are not part of the communication.

1  2  3  4  5  6  7  8  9  10  11  12

15 sec. intervals

Total:

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### Appropriate affect/emotional appropriateness

1  extremely passive  
2  unconvincing  
3  firm  
4  convincing  

### VERBAL CONTENT

**Statement of the problem:** clear statement indicating the existence of a problem situation.

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**Total:**

**Verbal noncompliance (score if this is a refusal situation):** statement expressing clear noncompliance or disagreement with the actor's unreasonable behavior e.g. I'm not willing to do that, you must stop that etc.

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**Total:**

**Request for new behavior or alternative proposed (refusal situation):** request for assistance in the form of a question and not a statement e.g. would you look after my dog? - score in request situations.

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**Total:**

**Appreciation statement:** expressing gratitude or thankfulness while making the request or after the request has been accepted - score in request situations.

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**Total:**
OVERALL ASSERTIVENESS

1 2 3 4 5
very unassertive 3 4 very assertive

RATER'S INITIALS:
FEEDBACK FORM

To help us to assess the personal relevance of the interactions represented in the role plays you have participated in, please circle the appropriate response categories below:

1. How stressful was role play #1?

   1  2  3  4  5
   not at all  moderately  very
   stressful    stressful    stressful

   How stressful was role play #2?

   1  2  3  4  5
   not at all  moderately  very
   stressful    stressful    stressful

   How stressful was role play #3?

   1  2  3  4  5
   not at all  moderately  very
   stressful    stressful    stressful

2. Were your responses in role play #1 similar to your responses to such situations in everyday life?

   1  2  3  4  5
   not at all  somewhat  very
   typical     typical     typical

   Were your responses in role play #2 similar to your responses to such situations in everyday life?

   1  2  3  4  5
   not at all  somewhat  very
   typical     typical     typical

   Were your responses in role play #3 similar to your responses to such situations in everyday life?

   1  2  3  4  5
   not at all  somewhat  very
   typical     typical     typical
3. To what extend did you use the assertiveness skills on which you received training -

During role play #1?

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<tr>
<td>not at all</td>
<td>somewhat</td>
<td>greatly</td>
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During role play #2?

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<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
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During role play #3?

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<tr>
<td>not at all</td>
<td>somewhat</td>
<td>greatly</td>
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Question 2 was replaced by question 3 in post-AT sessions.
Appendix C

Participant Satisfaction Survey and Mean Ratings
### Participant Satisfaction Survey and Mean Ratings

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<tbody>
<tr>
<td>1. How easy was the assertiveness training to understand and apply?</td>
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<td>very easy</td>
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<td>slightly difficult</td>
<td>difficult</td>
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| 2. Since receiving assertiveness training, I have used the skills: |   |   |   |   |   |   |   |
|   | not at infrequently | not frequently | very much frequently |   |
| 1 | 2 | 3 | 4 | X | 5 |   |

| 3. How easy was the relaxation training to understand and apply? |   |   |   |   |   |   |
|   | very easy | easy | slightly difficult | difficult | very difficult |   |
| X | 2 | 3 | 4 | 5 |   |   |

| 4. Since receiving relaxation training, I have used the skills? |   |   |   |   |   |   |   |
|   | not at infrequently | not frequently | very much frequently |   |
| 1 | 2 | 3 | 4 | X | 5 |   |

| 5. Before receiving assertiveness training, stressful interactions with others distressed me: |   |   |   |   |   |   |
|   | very much | much | not much | very little | not at all |   |
| X | 2 | 3 | 4 | 5 |   |   |

| 6. After receiving assertiveness training, stressful interactions distress me: |   |   |   |   |   |   |
|   | very much | much | not much | very little | not at all |   |
| 1 | 2 |   | 3 | 4 | 5 |   |

| 7. Before receiving relaxation training, stressful interactions with others distress me: |   |   |   |   |   |   |
|   | very much | much | not much | very little | not at all |   |
| X | 2 | 3 | 4 | 5 |   |   |
8. After receiving relaxation training, stressful interactions with others distress me:

1  2  3  X  4  5
very much  much  not much  very little  not at all

9. Please rate how satisfied you are with your success as a participant in this study:

1  2  3  4  X  5
very dissatisfied  neutral  satisfied  very satisfied  satisfied
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