Anger Control in Men: Barb Exposure With Rational, Irrational, and Irrelevant Self-Statements

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Anger can be frequent, intense and enduring, and is associated with intrapersonal and interpersonal distress as well as medical disorders. It is, therefore, important that effective treatments be developed. Based on the rational-emotive behavior therapy hypothesis that situational anger experiences are related to irrational thinking, we evaluated the therapeutic effects of practice with rational self-statements. Angry adult men ($n = 45$) from the community received 12 individual treatment sessions which consisted of repeated exposure to anger-provoking verbal barbs while they rehearsed rational, irrational or irrelevant self-statements. Results were generally supportive of the rational-emotive based intervention. In response to imaginal and face-to-face provocations, men who practiced rational self-statements were less angry on measures of state anger, anger-out, dynamometer intensity, and dynamometer frequency. Reactions to the barb technique were good, as indicated by a positive therapeutic alliance. Further exploration of this technique as part of a full spectrum treatment strategy for anger is recommended.

Anger is a common and multifaceted reaction to perceived aversive events. When anger episodes are frequent, intense, or enduring they may lead to serious negative consequences such as aggression, family violence, damage to interpersonal relations, health problems, and subjective distress (Kassinove & Sukhodolsky, 1995). Nevertheless, despite significant advances in understanding

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and treating other emotional disorders such as anxiety and depression, relatively little is known about anger.

A number of researchers have commented on the neglect of anger by noting the paucity of valid assessment instruments (Barefoot & Lipkus, 1994; Biaggio, 1980; Biaggio, Suplee, & Curtis, 1981; Deffenbacher et al., 1996), the lack of an official diagnostic category for people whose primary emotional problem is anger (Deffenbacher 1993; Eckhardt & Deffenbacher, 1995; Novaco, 1985), a dearth of controlled treatment outcome studies (Tafrate, 1995), a large gap in the number of citations for anger as compared with depression and anxiety (Kassinove & Sukhodolsky, 1995), the low number of panels devoted to anger at professional meetings (Tafrate & Kassinove, 1995), and the low level of funding for anger-related investigations (Eckhardt & Deffenbacher, 1995). This lack of scientific attention stands in sharp contrast to the central role given to anger by lay persons, novelists, the media, etc. A 75-year history of surveys of natural episodes of anger in nonclinical samples supports the idea that anger is a commonly experienced emotion. It is estimated that most people become mildly to moderately angry anywhere from several times a day to several times a week (Anastasi, Cohen, & Spatz, 1948; Averill, 1979, 1982, 1983; Gates, 1926; Meltzer, 1933; Richardson, 1918), and that most anger episodes occur during social interactions, are characterized by primarily verbal behaviors such as arguing and sarcasm, and lead to negative consequences approximately half of the time (Kassinove, Sukhodolsky, Tsytsarev, & Solovyova, 1997). The frequency, intensity, and persistence of anger episodes, along with associated negative consequences, are likely to be even greater in clinical samples. When Deffenbacher and Thwaites (1991) asked high- and low-trait anger university students to describe their worst anger incidents, the high-anger participants reported significantly greater physical damage to self and others, greater physical damage to objects, and more damage to relationships. In addition, high-anger participants scored lower on measures of self-esteem, higher on measures of anxiety, and were more likely to misuse alcohol. Given that anger is a frequent experience with the potential to become a distressing problem, especially among clinical groups, there is sufficient reason to develop effective interventions.

The purpose of the present investigation was to test the effectiveness of rehearsing rational self-statements, as defined in rational-emotive behavior therapy (REBT; Dryden, 1996; Ellis, 1977), for anger reduction in a treatment analogue experiment. Although REBT is a multifaceted approach to cognitive-behavior therapy, a central goal is to show patients how to examine their irrational beliefs and change them to more rational alternatives. When effective, these changes are hypothesized to lead to a decrease in emotionality (e.g., anger) when faced with stressors. Reviews have shown that REBT has been applied to a wide variety of problems and populations with varying conclusions about efficacy. Several have found it to be rather effective (DiGiuseppe,

Miller, & Trexler, 1977; Lyons & Woods, 1991; McGovern & Silverman, 1984; Silverman, McCarthy, & McGovern, 1992), while others have been less positive in their evaluation (Gossette & O'Brien, 1992; Haaga & Davison, 1989). A recent quantitative review of 28 treatment outcome studies found REBT to be superior to no treatment and as effective as behavioral interventions (Engels, Garnefski, & Diekstra, 1993). Unfortunately, these reviews have been general in nature and, thus, while some empirical support for REBT exists, it is not specific to anger.

In the modern version of his REBT model, Ellis postulated four core beliefs as mediators of emotions such as anger (Waler, DiGiuseppe, & Dryden, 1992). These are *awfulizing* (exaggerating the consequences or level of hardship associated with aversive events), *low frustration tolerance* (underestimating one's ability to deal with discomfort or adversity), demandingness (elevating personal desires to moral dictates or rules which are imposed on self, others, and the world), and *global self/other ratings* (blaming and condemning people in-toto for specific behavioral acts). According to REBT, these are the kinds of beliefs that angry people typically hold and which become activated in the face of negative events such as rejection, insults, injustice, etc.

Although the role of cognitive processes in anger arousal has received scant research attention, there is some support for the hypothesis that high-anger individuals are likely to exhibit the types of irrational beliefs proposed by the REBT model. Correlational research has found significant, moderate overlap between self-reported anger and irrational belief endorsement among several subject groups including undergraduate students (Hazaleus & Deffenbacher, 1985; Hogg & Deffenbacher, 1986; Kassinove & Eckhardt, 1993; Mizes, Morgan, & Buder, 1990; Zwemer & Deffenbacher, 1984), clinical outpatients (Deffenbacher, 1992), maritally violent men (Lohr, Hamberger, & Bonge, 1988), and violent prison inmates (Ford, 1990). In several laboratory investigations, maritally violent men exposed to inflammatory simulated situations, articulated more irrational verbalizations than maritally satisfied nonviolent men (Eckhardt & Kassinove, 1997), and maritally distressed nonviolent husbands (Eckhardt, Barbour, & Davison, 1997).

In spite of the preliminary support for the theoretical link between Ellis's irrational beliefs and anger, cognitive treatments for anger such as REBT have received very little research attention. In a meta-analytic review (Tafrate, 1995) of the psychotherapy outcome literature for anger, support was found for several approaches although the number of available experimental studies (*n* = 17) was small. Self-instructional training, relaxation-based strategies, social skills training, and multicomponent treatment packages emerged with some degree of support (effect size estimates ranged from .48 to 1.63). Techniques based on catharsis were found unlikely to be helpful and possibly to lead to increases in anger. Interestingly, and of importance for this paper, no controlled outcome studies were found which specifically examined the effectiveness

of REBT for children or adults with anger problems. This represents a significant gap in the literature since REBT is widely practiced and Ellis has repeatedly been rated as among the 10 most influential of all psychotherapists (Smith, 1982; Warner, 1991).

In the present study we explored the effectiveness of rehearsing rational self-statements, based on the REBT model, in comparison with two self-statement control conditions, for anger reduction. The intervention represented a limited version of full spectrum REBT, since other commonly used techniques such as discussion and disputation were not used. In order to increase ecological validity, a community sample of men with anger problems was selected to participate. Given that anger is most frequently experienced in interpersonal situations, the study was designed to help individuals reduce their anger during interpersonal provocation. In addition, since support has been found for a relationship between the endorsement of each of the four irrational beliefs and negative emotionality (DiGiuseppe, Leaf, Robin, & Exner, 1988; Kassinove, 1986; Kassinove & Eckhardt, 1993), with no agreed upon conclusion as to which belief is most important, each of the four core ideas was incorporated into the intervention. It was predicted that participants who practiced rational self-statements while receiving repeated negative, aversive verbalizations would experience less situational anger in response to both imaginal and face-to-face laboratory provocations, as compared with participants who practiced irrational or irrelevant self-statements.

METHOD

Participants

Forty-five men between the ages of 20 and 56 ($M = 33.64$; $SD = 7.82$) who were experiencing problems with anger control served as participants. The sample (42 White, 1 Latino, 1 Black, and 1 Asian man) was recruited from the community through newspaper announcements about a research study on anger control. Forty-seven percent of the men were married, 36% were single, 13% were divorced, 2% were separated, and 2% were cohabitating. Years of education ranged from 10 to 20 ($M = 15.07$; $SD = 2.70$). Seventy-six percent of the men were employed full-time, 13% were unemployed, and 11% were employed part-time. Their self-reported incomes ranged from zero to $90,000 ($M = $32,964$; $SD = $21,180$) per year.

To be retained in the study, respondents had to indicate that they had a personal problem with anger and achieve a minimum score at the 75th percentile (>21) on Spielberger's (1988) Trait Anger Scale. Exclusionary criteria were current substance abuse, medical conditions which might contribute to anger problems, or current involvement in a treatment program for anger. This led to the exclusion of three respondents, two due to current substance abuse and one who had recently suffered a head injury.

Pretest means on the State-Trait Anger Expression Inventory (Spielberger, 1988) were similar to those of previously used samples in the anger literature with respect both to the propensity to experience anger across situations and to self-reported modes of anger expression (Deffenbacher & Stark, 1992; Deffenbacher, Thwaites, Wallace, & Oetting, 1994; Hazaleus & Deffenbacher, 1986). Thirty-six percent of the men had engaged in at least one physical act of aggression toward another person within a year of participation in the study and 13% had been arrested by the police at least once. Most of the men reported significant negative consequences associated with their anger such as loss of family relationships, romantic relationships, friendships, and jobs. As noted above, men who reported current substance abuse were excluded from partici- pation. Nevertheless, 24% of the men reported a history of substance abuse and many reported being actively involved in ongoing self-help groups such as alcoholics anonymous and narcotics anonymous.

Design

A 3 x 2 (condition x time) randomized pretest to posttest design, with 15 participants per self-statement condition, was used. The three conditions were: barb exposure with rational self-statements, barb exposure with irrational self- statements, and barb exposure with irrelevant self-statements. The two levels of time reflected the measurement of most dependent variables at pretest and posttest. The project was reviewed and approved by the Institutional Review Board prior to implementation and all men signed and informed consent form.

Measures

Screening and Process Measures. As noted above, scores on the Trait Anger Scale (Spielberger, 1988) were used for selection or exclusion purposes. This scale consists of 10 statements which describe subjective feelings of anger and is designed to measure an individual's general propensity to experience and express anger. In response to the sentence stem, "How I generally feel," the men rated their responses on a 4-point Likert type scale (1 = almost never, to 4 = almost always). This scale has been shown to be internally consistent (α = .82; Spielberger, 1988), to correlate positively with other measures of anger (Spielberger, 1988) and to discriminate high-anger individuals from others (Deffenbacher, Demm, & Brandon, 1986; Lopez & Thurman, 1986).

Since the intervention involved the delivery of aversive verbal stimuli, a question arose about the reactions by the participants. Therefore, the client form of the Working Alliance Inventory (Horvath & Greenberg, 1989) was administered to each man at posttest to obtain a measure of the perceived working alliance with the experimenter. This 36-item questionnaire contains three subscales; clients' perception of agreement on goals, perception of

agreement on tasks, and formation of a bond. Each item is rated on a seven-point Likert type scale (1 = never, to 7 = always) which assesses the degree to which they believe the item reflects the alliance between themselves and the experimenter (or therapist) during the treatment sessions. Alpha reliability coefficients in the present sample ranged from .75 to .91, suggesting good internal consistency. Working Alliance Inventory scores have been shown to correlate positively with client ratings of therapists' attractiveness, expertness, and trustworthiness (Tracey & Kokotovic, 1989). Lower scores have been associated with poor outcome and premature termination of therapy while higher scores have been associated with good treatment outcome (Samstag, Batchelder, Muran, Safran, & Winston, 1994).

Outcome Measures. Anger was considered to be a multifaceted pattern of responses to aversive (often verbal) events. Thus, it was assessed across a variety of dimensions including self-report, behavioral expressions (i.e., hand dynamometer readings), physiological arousal (i.e., systolic blood pressure), and observer ratings of angry facial expression. This multichannel assessment approach was also conducted in response to several types of experimental provocation.

In addition to its screening function, scores on the Trait Anger Scale were also obtained at posttest and were used as an outcome measure. Modes of expression (i.e., the tendency to generally hold anger in, to express anger outwardly, or to remain calm and control anger) were assessed at pretest and posttest by Spielberger's (1988) Anger Expression Scale. This self-report measure consists of three 8-item subscales on which the men were asked to rate, on a 4-point Likert type scale (1 = almost never, to 4 = almost always), the degree to which each statement describes how they express themselves when angry. The anger expression scales have internal consistency reliabilities which range from .73 to .84, have been shown to correlate positively with other measures of anger (Deffenbacher, 1992; Spielberger, 1988), and are not highly positively correlated with each other (Spielberger, 1988).

The State Anger Scale was used to assess situationally experienced, self-reported anger in response to the imaginal and the face-to-face provocations. The men were asked to rate 10 items on a 4-point Likert type scale (1 = not at all, to 4 = very much so), which might or might not be descriptive of them at the moment a provocation ended. This scale has been shown to be internally consistent (a = .90; Spielberger, 1988), and to correlate with other self-report state measures during laboratory provocations (Deffenbacher, Demm, & Brandon, 1986). A slightly modified version of the State Anger Scale was administered following each of the imaginal provocation scenes. In this modified version, the 10 items remained identical except that participants were asked to rate how they think they "would have felt had they just experienced the situations described on audiotape." Alpha coefficients for the

modified version, in response to the three imaginal scenes, remained high and ranged from .89 to .94.

During the imaginal scenes and the face-to-face provocation, behavioral expressions of anger were measured with the use of a hand dynamometer. Each man was instructed to squeeze on the hand dynamometer at the moment he experienced anger and to do so to the extent that he felt himself getting angry. The dynamometer measured, in kilograms (range 0–100), the maximum intensity of fist clenching. A maximum intensity rating was recorded directly from the instrument immediately following each provocation situation. In addition, the dynamometer was connected to an amplifier and transducer so that, during each provocation, the frequency with which it was squeezed could be easily monitored and recorded. Prior to use, participants were briefly trained in its operation and were asked to demonstrate low, medium, and high levels of anger by squeezing on the hand grip.

To obtain a measure of physiological arousal, systolic blood pressure was measured by an electrosphygmomanometer immediately following the face-to-face provocation. Blood pressure readings were recorded manually from the visual display. Increased blood pressure has previously been noted following exposure to anger-provoking role plays (Moon & Eisler, 1983; Novaco, 1975), annoying confederates (Diamond et al., 1984; Engebretson, Matthews, & Scheier, 1989; Glass et al., 1980), and imaginal provocations (Novaco, 1974, 1975).

Finally, facial responses of each man during the face-to-face provocations were videotaped. Two independent raters, both graduate students, scored identical segments of the videotapes for indicators of angry facial expression. Raters were trained according to the Affex Manual (Izard, Dougherty, & Hembree, 1980) regarding the rating criteria for anger. Scoring procedures were demonstrated and each rater then scored three practice segments of the videotape in conjunction with the first author. Reliability between the raters and the experimenter was calculated by the formula: agreements divided by the total number of agreements and disagreements combined. For the practice segments, the reliability between each rater and experimenter exceeded .95.

Provocation Situations

In order to assess situational anger, which was considered the main aim in this study, a series of aversive imaginal and face-to-face provocations were developed. The provocations were designed as stimuli, to which subjects would individually respond and from which outcome measures could be obtained.

Five imaginal provocations (three delivered at pretest and posttest, and two additional ones at posttest only) consisted of audiotaped scenes, approximately 90 seconds in length, which required that each man imagine that he was

receiving unfair and/or aggressive treatment from others. The scenes for pretest and posttest assessment involved an insulting store clerk, an inconsiderate driver, and another man "picking up" the participant's wife/girlfriend. The additional posttest only scenes involved a rude restaurant hostess, and people talking loudly at a movie. The men were instructed to imagine themselves as actual participants in each scene.

For the face-to-face provocation, the experimenter said 30 statements to each man in a moderately forceful manner. Subjects were seated approximately 20 feet away from the experimenter who was standing. In order to allow for a contrast in facial reactions and behavioral expressions (hand dynamometer readings), 5 of the statements were positive (e.g., "[name], I admire your decision to do this and to work on your anger"), 5 were neutral (e.g., "I think that the clothes that you are wearing are appropriate"), and 20 were provocative and often profane (e.g., "To be honest with you [name], I thought you were a fucking loser the first moment I saw you").

The imaginal provocation scenes and the face-to-face statements had been pilot-tested on a sample of male undergraduate students and were found to be anger inducing. None of the statements used for the face-to-face provocation was used in the treatment sessions. All assessments were conducted by the first author.

Self-Statement Conditions

The Barb Technique. Each man was exposed to the barb technique (Kaufman & Wagner, 1972), in which the experimenter systematically delivers negative (i.e., aversive and sometimes profane) statements designed to provoke anger. Barbs were targeted at personal characteristics in five main areas: physical appearance (e.g., "[Name], you look so unkept and sloppy, like you don't care about yourself"), intelligence (e.g., "Your low intelligence seems obvious to everybody who meets you [name]"), personality (e.g., "[Name] I'm sure you don't have any friends because you are so goddamn irritating"), athletic ability (e.g., "[Name] you just look like such a fucking wimp"), and achievement (e.g., "You know [name], you are really a loser"). Barbs were used as a context within which the men could practice their respective self-statements. Each experimental condition consisted of subjects rehearsing a group of four self-statements in response to the same series of barbs.

Barb Exposure With Rational Self-Statements. Men in this condition were trained to recite self-statements which, based on rational-emotive behavior theory, were expected to lead to reduced anger. Four rational self-statements were developed to address each of the core irrational ideas (i.e., awfulizing, low frustration tolerance, demandingness, and global rating of the other person). The following rational self-statements were designed to be relevant to the context of the barbing sessions and to promote anger control: (a) "It's only unpleasant, but not terrible, that [name of experimenter] is talking to me this

way," (b) "I can stand hearing this stuff and I don't have to react with anger," (c) "I would prefer it if [name of experimenter] would talk nicely to me, but there is no reason why he must, " and (d) "Even though [name of experimenter] is saying this stuff about me, he may still be an OK person in other ways."

Barb Exposure With Irrational Self-Statements. Men in this condition were trained to recite self-statements which, according to rational-emotive behavior theory, were expected to lead to no improvement. These are postulated to be the kinds of irrational self-statements that people typically make to themselves when they receive aversive, unwanted feedback. Again, the statements were designed to reflect the four core irrational ideas of rational-emotive behavior theory. The statements used were, (a) "It's terrible that [name of the experimenter] is talking to me this way," (b) "I can't stand hearing this stuff," (c) "[Name of the experimenter] should treat me with more respect," and (d) "Because [name of the experimenter] is saying this about me, he is a real jerk." Because it was believed that these were similar to the types of statements that subjects were already making, adverse affects were not expected.

Barb Exposure With Irrelevant Self-Statements. In this condition participants were trained to recite four self-statements which were unrelated to anger. Derived from a collection of proverbs (Sefire & Safir, 1989), the statements were, (a) "If you want your dreams to come true, don't sleep," (b) "Don't throw away the old bucket until you know if the new one holds water," (c) "When you want to test the depth of a stream don't use both feet," and (d) "When in doubt who will win, be neutral."

Procedure

Respondents to the advertisement met individually with the first author for an initial screening (session 1). At that time they completed the Trait Anger Scale, the Anger Expression Scale, a medical history questionnaire, a demographic information sheet, and signed an Informed Consent Form. Those who met the criteria for participation were so notified and a time was set for additional assessment (session 2). Respondents who did not meet the criteria for participation were referred, if they desired, to a low-cost clinic for treatment.

As noted above, except for two additional audiotaped provocations which were administered only at posttest, assessments were conducted both before and after the intervention. In session 2, the men were individually exposed to the three audiotaped, imaginal provocation scenes and the verbal face-to-face provocation. For each of the imaginal provocation scenes, self-reported state anger and hand dynamometer intensity and frequency recordings were obtained. In response to the face-to-face provocation (in addition to state anger, and hand dynamometer frequency and intensity), videotapes of facial expressions were also made and systolic blood pressure was recorded.

Following the second assessment session, each man was randomly assigned to one of the three self-statement conditions. The men received 12 half-hour

individual sessions and, since each contained an element of repeated verbal barb exposure, all interventions were conducted with the expectation that they would lead to anger reduction. The men in each condition were encouraged to meet with the experimenter on a weekly basis until the 12 sessions were completed. In the case of a missed appointment, and if time allowed, a makeup session was scheduled for the same week.

Before beginning the sessions, the barb technique was thoroughly explained to each man and a rationale which contained the following elements was given; (1) many psychological treatments involve exposing people to situations they find most difficult, (2) sustained exposure often leads to less arousal and less emotional upset, and (3) participants who practice responding to provocation without anger will be able to respond more constructively to such situations in the future.

During the sessions, the experimenter delivered the barbs while sitting across a table and facing the participant. Ten barbs were presented, four times each, per session. Thus, there were a total of 480 practice opportunities (10 barbs x 4 presentations x 12 sessions). During the first four sessions, barbs were preceded by the cue phrase "[name of participant], get ready here comes the barb." Participants recited their respective self-statements aloud while reading them directly from printed cards. In the next four sessions, the cue phrase preceding each barb was faded to "Ready." Each man was now encouraged to say the self-statements aloud while recalling them from memory. Feedback was given if the statements were said incorrectly. During the final four sessions, no cue was given by the experimenter prior to delivery of the barbs and each man was instructed to rehearse the statements silently to himself. In order to engage participants in the sessions, other elements in each session included a warm greeting, an inquiry such as "how are you doing," and listening for several minutes prior to beginning the self-statement rehearsal. These interactions took place with participants in all treatment groups and were deliberately kept as brief as possible.

Following the 12 treatment sessions, each man met with the experimenter for a final assessment session in which the Trait Anger Scale, the Anger Expression Scale, and the Working Alliance Inventory were completed. The imaginal provocation scenes and the face-to-face provocations were again presented to each man and outcome measures were obtained in the manner previously described. The two additional audiotaped provocation scenes were also presented at posttest. State Anger and dynamometer intensity and frequency ratings were recorded in response to these new scenes.

RESULTS

Preliminary Analyses

Chi-square and one-way analyses of variance were used to examine possible pretest differences among the three groups on the demographic variables. No

significant differences were found with regard to age, education, income, ethnicity, or employment status.

Working Alliance Inventory scores were used to determine if there were any systematic differences among men in the three conditions in their perceived alliance with the experimenter following the experimental sessions (Table 1). Four one-way ANOVAs indicated nonsignificant differences for the total score, $F(2, 42) = 1.35$; *ns*, and for agreement on goals, $F(2, 42) = 1.09$; *ns*, agreement on tasks, $F(2, 42) = 1.66$; *ns*, and formation of a bond, $F(2, 42) = .98$; *ns*. In addition, all means were above 4.5. Since scores of less than 4.5 are considered to indicate problems in the therapeutic alliance and to predict premature termination (Samstag et al., 1994), it seems that the men in all groups reported an acceptable or positive therapeutic experience.

The dropout rate was also examined to determine if there were any differences among the self-statement groups. Following the two initial screening and assessment sessions, eight men dropped out of the study at various points in treatment. Three were in the rational self-statement group, two were in the irrational self-statement group, and three were in the irrelevant self-statement condition. These men were replaced to assure that 15 men per group completed each condition. Since dropout rates were almost identical, no systematic differences are believed to have influenced the results.

Self-Statement Effects

Differential effects of the self-statement groups were explored in a series of analyses of covariance (ANCOVAs) in which pretest scores served as the covariate. When a significant self-statement effect was found, the Bryant-Paulson procedure (BP; Bryant & Paulson, 1976) was used to explore the differences among the three groups.[1] Dependent measures associated with the novel provocation scenes, which were given at posttest only, were analyzed by one-way ANOVAs. Due to the exploratory nature of the study, alpha was kept at $p < .05$ for all planned comparisons. Although the situational effects of anger

Table 1. Means and Standard Deviations on the Working Alliance Inventory

	Rational self-statements		Irrational self-statements		Irrelevant self-statements	
	M	*SD*	*M*	*SD*	*M*	*SD*
Total Alliance Score	6.29	.40	5.99	.61	6.14	.46
Agreement on Goals	6.30	.39	6.01	.62	6.07	.65
Agreement on Tasks	6.26	.51	5.87	.71	6.01	.53
Perception of a Bond	6.31	.52	6.09	.59	6.33	.46

were of primary importance, trait anger and anger expression effects are presented first since they represent broad facets of anger.

Trait Anger and Anger Expression. Table 2 presents pretest and adjusted posttest means and standard deviations for trait anger and each of the three anger expression modes. The ANCOVA indicated that the effect of self-statement rehearsal on trait anger was nonsignificant, $F(2, 41) = 1.09$; *ns*. On the anger expression scales, the ANCOVAs indicated a significant self-statement effect for Anger Out, $F(2, 41) = 3.31$; $p < .05$. Men in the rational self-statement condition reported less outward expression of anger than did men in either the irrational (BP= 3.74; $p < .05$) or irrelevant (BP = 6.02; $p < .05$) conditions. The irrational and irrelevant conditions did not differ from each other. There were no significant differential effects among the self-statement groups for Anger In, $F(2,41) = .80$; *ns*, or for anger control, $F(2, 41) = 2.06$; *ns*.

Situational Responses to Imaginal Provocations. Participants were exposed to three of the imaginal provocations prior to and following the 12 treatment sessions. Means and standard deviations for responses to these provocations are presented in Table 3. Responses for state anger, dynamometer intensity, and dynamometer frequency were averaged across the three imaginal scenes and analyses were then conducted on the mean scores.

The ANCOVA indicated a significant self-statement effect on state anger, $F(2, 41) = .81$; $p < .05$. At the end of treatment, men in the rational self-

Table 2. Unadjusted Prettest and Adjusted Posttest Means and Standard Deviations for the Three Self-Statement Conditions

	Rational self-statements		Irrational self-statements		Irrelevant self-statements	
	M	*SD*	*M*	*SD*	*M*	*SD*
Trait anger scale						
Unadjusted Pretest	26.40	4.88	26.07	5.19	27.60	5.03
Adjusted Posttest	19.67	4.34	21.43	5.90	21.91	6.20
Anger expression scales						
Anger in						
Unadjusted Pretest	20.40	5.91	19.60	5.45	18.27	3.99
Adjusted Posttest	14.93	3.94	16.37	5.00	15.91	3.69
Anger out						
Unadjusted Pretest	20.53	4.16	20.00	3.80	21.60	4.95
Adjusted Posttest	15.07	2.56	16.83	3.25	17.90	4.40*
Anger control						
Unadjusted Pretest	16.67	4.47	17.80	3.08	17.00	4.16
Adjusted Posttest	22.03	5.05	19.28	3.33	19.29	5.77

* = $p < .05$.

Table 3. Unadjusted Pretest and Adjusted Posttest Means and Standard Deviations for Responses to the Imaginal and Face to Face Provocations

	Rational self-statements		Irrational self-statements		Irrelevant self-statements	
	M	*SD*	*M*	*SD*	*M*	*SD*
Responses to imaginal provocation scenes						
State anger						
Unadjusted Pretest	27.91	6.06	26.91	7.51	28.87	6.67
Adjusted Posttest	18.95	6.82	24.22	4.61	23.90	7.94*
Dynamometer frequency						
Unadjusted Pretest	3.82	2.38	4.33	2.78	4.31	1.54
Adjusted Posttest	1.77	1.52	2.97	1.85	3.48	2.70
Dynamometer intensity						
Unadjusted Pretest	27.82	10.31	24.80	12.36	27.47	8.66
Adjusted Posttest	11.82	7.77	21.14	8.59	17.13	8.75**
Responses to face-to-face provocation						
State anger						
Unadjusted Pretest	18.40	9.90	16.20	5.70	16.20	8.35
Adjusted Posttest	10.27	.99	13.77	4.65	13.43	4.84*
Dynamometer frequency						
Unadjusted Pretest	11.60	7.81	14.73	7.65	11.80	7.41
Adjusted Posttest	5.74	6.42	12.27	7.32	10.59	7.51*
Dynamometer intensity						
Unadjusted Pretest	24.40	10.69	27.53	7.22	27.13	11.21
Adjusted Posttest	10.90	9.78	21.04	11.81	17.05	12.75
Systolic blood pressure						
Unadjusted Pretest	130.67	12.55	128.80	15.39	126.27	11.84
Adjusted Posttest	122.72	7.37	120.97	13.57	120.17	10.25
Facial expressions						
Unadjusted Pretest	7.13	10.33	7.80	7.17	3.53	4.63
Adjusted Posttest	2.35	5.04	3.10	5.10	3.15	2.99

*= $p < 05$; **= $p < .01$.

statement condition reported significantly less state anger than did the men in either the irrational (BP = 7.03; $p < .05$) or irrelevant (BP = 6.60; $p < .05$) self-statement groups. No differences were found between the irrational and irrelevant conditions.

Although they approached significance and favored participants in the rational self-statement condition, the ANCOVA results for dynamometer

frequency were not significant, $F(2, 41) = 2.90$; *ns*. However, the overall low frequency of hand grips observed at posttest (M = 2.74) combined with relatively large standard deviations may have masked potential self-statement effects.

The ANCOVA for dynamometer intensity was significant, $F(2, 41) = 5.85$; $p < .01$. Following the treatment sessions, men in the rational self-statement condition exhibited significantly lower dynamometer intensity readings than did the men in either the irrational (BP = 8.88; $p < .05$) or irrelevant (BP = 5.06; $p < .05$) self-statement groups. In addition, men in the irrelevant self-statement condition exhibited significantly lower dynamometer intensity readings than did the men in the irrational self-statement group (BP = 3.82; $p < .05$).

Responses to the Face-to-Face Provocations. Means and standard deviations for responses to the face-to-face provocations are also presented in Table 3. The ANCOVA for state anger indicated a significant self-statement effect, $F(2, 41) = 3.81$; $p < .05$. Men in the rational self-statement group reported a significantly lower level of anger following the provocation as compared with men in either the irrational (BP = 12.07; $p < .05$) or irrelevant (BP = 10.90; .05) self-statement groups. There was no significant difference for responses of men in the irrational versus the irrelevant conditions.

With regard to hand dynamometer readings, a significant effect was found for frequency, $F(2, 41) = 4.15$; $p < .05$. Men in the rational self-statement condition displayed significantly fewer grips on the hand dynamometer in response to the provocation than did the men in either the irrational (BP = 7.59; $p < .05$) or irrelevant (BP 5.64; $p < .05$) conditions. No differences were found between the irrational and irrelevant conditions. The main effect of dynamometer intensity was not significant, $F(2, 41) = 3.12$; *ns*.

The ANCOVAs also showed nonsignificant effects for systolic blood pressure, $F(2, 41) = .30$, *ns*, and frequency ratings of angry facial expressions, $F(2, 41) = .25$; *ns*. However, as reported above for hand grips during the imaginal provocations, we note that there were surprisingly few spontaneous facial indicators of anger during the face-to-face provocation, especially at posttest ($M_{posttest} = 2.87$).

Responses to Additional Imaginal Provocations (posttest only). Each man was exposed to two new imaginal provocations following the 12 treatment sessions. Responses (see Table 4) on each of the dependent measures were averaged across the two imaginal scenes. One-way ANOVAs with three levels of treatment (rational, irrational, and irrelevant) were then conducted on the mean scores. Significant self-statement effects were explored using the Tukey test.

The ANOVA for state anger was nonsignificant, $F(2, 42) = 2.46$; *ns*. However, between group differences were found for both dynamometer intensity, $F(2,42) = 12.46$; $p = .001$, and dynamometer frequency, $F(2,42) = 4.81$; $p < .05$. Men in the rational self-statement condition exhibited significantly

Table 4. Posttest Means and Standard Deviations for Response to the Novel Imaginal Provocations

	Rational self-statements		Irrational self-statements		Irrelevant self-statements	
	M	*SD*	*M*	*SD*	*M*	*SD*
State anger	17.83	6.57	22.73	5.65	21.83	7.02
Dynamometer intensity	9.30	6.52	22.70	7.49	16.63	7.99***
Dynamometer frequency	2.03	1.64	4.60	2.89	5.20	3.92

*$p < .05$; ***$p < .001$.

lower dynamometer intensity readings and less frequent responding than did the men in either the irrational or irrelevant self-statement conditions. In addition, men in the irrelevant self-statement group exhibited significantly lower dynamometer intensity readings than those in the irrational self-statement group.

Pre-to-Posttest Effects. The magnitude of improvement over time for each self-statement group was examined by calculating pre-to-posttest effect sizes (d) on each outcome measure. Effect sizes were computed on the pretest and unadjusted posttest means and standard deviations with the assistance of the DSTAT statistical program (Johnson, 1989). Cohen (1977) has offered some rough guidelines for interpreting effect size estimates in psychotherapy outcome research. Effect sizes of .2 are considered small, effect sizes of . 5 are considered moderate, and effect sizes greater than .8 are considered large. Pre-to-posttest effect sizes (Table 5) for the rational self-statement group ranged from .54 to 1.61, with an average effect size across all outcome measures and provocation conditions of 1.10. This indicates a large effect over time. For the irrational self-statement group, the pre-to-posttest effect sizes ranged from .20 to .93 with an average effect size of .57, indicating a moderate improvement over time. For the irrelevant self-statement group, effect sizes ranged from .20 to 1.09 with an average effect size of .64, again indicating moderate improvement over time.

Correlations Among the Measures

A number of the outcome measures (dynamometer intensity and frequency, and ratings of angry facial expressions) used in this study are new to the anger treatment literature. Thus, correlations were run on pretest scores in order to examine the interrelationships among the measures. To reduce experimentwise error for the multiple tests of significance on the correlations, alpha was set at $p < .01$ for individual tests (i.e., $r > .37$).

Of 66 correlations which were computed, 10 were significant. Among the self-reported anger measures, the Trait Anger Scale correlated significantly

Table 5. Pre-to-Posttest Effect Sizes for the Three Self-Statement Conditions

	Rational self-statements	Irrational self-statements	Irrelevant self-statements
	(d)	(d)	(d)
Trait anger	1.42	.86	.85
Anger in	.93	.57	.74
Anger out	1.51	.93	.98
Anger control	1.00	.65	.41
Imaginal provocation scenes			
State anger	1.31	.47	.59
Dynamometer frequency	1.02	.52	.34
Dynamometer intensity	1.61	.40	1.09
Face-to-face provocation			
State anger	1.07	.50	.40
Dynamometer frequency	.84	.20	.20
Dynamometer intensity	1.31	.59	.77
Systolic blood pressure	.65	.50	.60
Facial expressions	.54	.66	.69

with both the Anger-In and Anger-Out scales, while Anger-Out was negatively correlated with Anger-Control (r's = .39 to .66). These results correspond to those reported by Spielberger (1988). All three of the measures taken in response to the imaginal provocation scenes (dynamometer intensity and frequency, and State Anger) correlated positively and moderately with each other (r's = .41 to .61). Among the measures taken in response to the face-to-face provocation, dynamometer frequency correlated significantly with both dynamometer intensity and state anger (r'S = .40 to .52). Across the provocations, both dynamometer intensity and frequency correlated with themselves (r's = .37 to .44). However, systolic blood pressure and ratings of angry facial expression were unrelated or minimally related to other anger indices. Nevertheless, the large number of nonsignificant correlations and the moderate magnitude of the significant correlations suggests that various aspects of the anger construct were being measured.

DISCUSSION

The present study was the first to examine the hypothesis of REBT that four specific beliefs (awfulizing, low frustration tolerance, demandingness, and global ratings of others) can mediate anger experiences and modes of expression in response to aversive verbal stimulation. Anger was conceptualized as

a multifaceted response (Kassinove & Sukhodolsky, 1995) consisting of immediate phenomenological experiences (state anger), motor behaviors (hand dynamometer squeezes), physiological responses (blood pressure), facial expressions, and tendencies to respond to a variety of situations with anger (trait anger), which could be expressed in a variety of ways (anger in, anger out, and anger control). This study differed from most others in the anger literature in that our participants were truly angry adult community residents (see Tafrate, 1995). They scored above the 75th percentile on the Trait Anger Scale and many had signs of related dysfunctions such as acts of aggression, interactions with the police, histories of substance abuse, and negative interpersonal interactions with family members or on the job. Although the men were not actual clinic referrals, we believe that this kind of sample is as close as one can reasonably go in an exploratory study testing new anger-treatment techniques which involve provocation. Overall, the differential self-statement effects which were found are supportive of Ellis's REBT model.

Although the situational or state aspects of the anger response were considered as the primary targets of this investigation, we first looked at the results for trait anger and anger expression modes. Following the 12 intervention sessions, the men in the three conditions did not differ on trait anger. In retrospect, this might have been expected given that trait anger is defined as a tendency to experience states of anger in a wide variety of situations. Given the long and diverse history of anger experiences in the men who participated, an effect on the trait of anger would be unlikely after only 12 sessions. However, men in the rational self-statement condition did report that they were less likely to express their anger outwardly as compared with the men in the other two conditions. Since anger out includes both yelling (verbal behavior) and throwing objects, hitting walls, etc. (motor behavior), this finding has importance for the reduction of interpersonal conflict such as that which occurs in marriages and families, on the job, and in other interpersonal situations. This kind of conflict often begins with anger and escalates into aggression. Thus, targeting specific irrational beliefs may be an important component of any treatment strategy that attempts to reduce anger and aggression.

For the situational or state variables, anger reduction was achieved in response to the imaginal provocations on two of the three comparisons (state anger and dynamometer intensity) favoring the men who practiced the rational self-statements. Although no effect emerged for dynamometer frequency, the means were in the predicted direction. An overall low frequency of hand grips at posttest may have limited the likelihood of detecting a significant difference on this measure. Since the use of the hand dynamometer is new to the anger treatment literature, this possibility was unanticipated. It seems likely that higher frequencies could be achieved with longer provocation scenes, thus making this measure more sensitive to potential treatment effects. With regard to the face-to-face verbal provocations, significant effects were found for state

anger and dynamometer frequency, but not dynamometer intensity, systolic blood pressure, or facial expression ratings. Again, we note that few spontaneous facial indicators of anger were shown during the face-to-face provocation, making it unlikely that potential treatment effects would be detected. Participants may have censored their facial expressions due to the presence of the video camera. Also, the instructions given to the men asked them to express their anger only by squeezing on the hand dynamometer, which may have discouraged other types of expression. With regard to the novel imaginal provocations which were administered at posttest only, the state anger effect was not significant. However, men who practiced the rational self-statements showed lower frequencies of responding and less intense responses on the hand dynamometer.

The hand dynamometer readings showed consistency across provocation situations and related moderately well with the State Anger Scale. This behavioral variable may well represent a useful indicator for the assessment of momentary behavioral expressions of anger in a laboratory setting. In contrast, the lack of finding for blood pressure and facial expressions bring into question the utility of these measures for the assessment of anger in studies such as this one.

In summary, significant effects which favored the men who practiced the rational self-statements, as defined by REBT, were shown on 6 of 11 situational variables assessed. In addition, while subjects in all three self-statement conditions demonstrated anger reduction over time, consistently greater improvement can be noted for subjects who rehearsed the rational self-statements (Table 5). This indicates preliminary experimental support for the specific statements postulated by REBT as potential mediators of anger. Few differences were found between the irrational and irrelevant self-statement conditions. Only two of the comparisons reached significance, favoring the irrelevant self-statement group over the irrational group. Men who rehearsed irrelevant self-statements showed less intense hand dynamometer readings in response to the imaginal provocations and to the novel imaginal provocations delivered only at posttest.

Irrational self-statements are hypothesized to be the kinds of beliefs that become activated when individuals become angry, and thus represent typical ways of thinking. When insulted or frustrated, REBT predicts that people (especially those high on trait anger) often exaggerate the magnitude of the event, see it as intolerable, and demand that it change, and that it is this kind of thinking that contributes to anger. Therefore, it might have been expected that the men in the irrational self-statement group would have shown more signs of anger at posttest as compared to those in the irrelevant self-statement group, and that the lack of differences minimizes support for REBT theory. A number of factors, however, diminish the veracity of that conclusion. During development of this study, we were concerned that men in the irrational self-

statement group might show increases in anger and possibly aggression when exposed to a constant barrage of aversive verbalizations. This raised an ethical concern as to whether to include this condition, as well as a concern about the safety of the experimenter. This ethical issue was resolved when it was realized that the irrational statements were simply commonly held beliefs which REBT posits become activated under perceived or real aversive conditions. Men who participated were hypothesized to already strongly hold such beliefs and, thus, the rehearsal of irrational self-statements was not expected to lead to increases in their already high level of anger. In fact, examination of pre-to-posttest Trait Anger scores demonstrated that the general level of anger in the men in the irrational condition did not increase as a result of participation in the treatment sessions. The safety concern was resolved by holding the treatment sessions in the on-campus university community clinic where help would be immediately available if it was required.

With regard to the barb exposure treatment sessions themselves, there were a range of observed but untargeted reactions including visible increases in muscle tension, fist clenching, clutching the chair, flushing of the face, and rapid, shallow breathing. On three occasions, the experimenter inquired if the participants were able to maintain control. In each case, they indicated that they could safely continue. There were no episodes of aggression in any of the 540 assessment and treatment sessions which were run. Part of this may be due to the fact that the barb sessions were delivered in a university clinic with the experimenter sitting across a table from the participants and with a video camera, blood pressure cuff, etc. in sight. These factors may have diminished the ecological validity of the study and the probability of outbursts. In addition, as an initial study, the treatment was not developed as a "full-strength package." The barbs which were developed were considered to be generically offensive for all of the participants. However, they were most likely to be on target for people who experience anger in response to interpersonal provocations. This was considered appropriate since research (Averill, 1983; Kassinove et al., 1997) has shown that most anger occurs in such contexts. In contrast, the procedure was less relevant for participants who tended to get angry about social injustices, a job loss, plans being disrupted, or machines and appliances not working or breaking down, etc. A number of the men commented about this, and requested that they be exposed to barbs that were more realistic and personal for them. A few even asked for audiotapes of the barbs so that they could practice at home. Although the procedure would probably have been more powerful if it was tailored to individualized triggers for each man, there were concerns that this might have elicited more anger and increased the risk of aggressive outbursts. Finally, the men in this study volunteered to participate. They appeared motivated, cooperative and sincere in their desire to achieve better control over anger and, as suggested by their Working Alliance Inventory scores, formed a positive relationship with the experimenter. These

factors would also be likely to minimize aggressive outbursts during the sessions.

The positive reaction of the participants to the barb procedure raises the question of the degree to which the barb exposure itself was an active therapeutic element. Exposure-based methods are commonly used in treatment programs for panic disorder (Barlow & Craske, 1989), generalized anxiety disorder (Craske, Barlow, & O' Leary, 1992), obsessive compulsive disorder (Foa & Wilson, 1991) and social phobia (Markway, Carmin, Pollard, & Flynn, 1992). Since anxiety and anger share some physiological and functional characteristics (Ax, 1953; Cannon, 1920; Selye, 1978), it is possible that exposure may also be useful in the treatment of anger problems. Inspection of pre-to-posttest effect sizes in Table 5 reveals consistent anger reduction across the various dependent measures and provocation conditions in each of the self-statement groups. The barb exposure was certainly one common therapeutic element that may account for the improvements. Unfortunately, this study was designed to control for self-statement content and not the effects of exposure, so a number of other explanations may account for the positive changes over time. Among these are nonspecific therapeutic factors such as a supportive relationship with the experimenter, a commitment from participants to reduce anger, and increased awareness of anger reactions. Pre-to-posttest improvements may also be partially due to increased familiarity and comfort with the experimenter, the provocation conditions, or the laboratory setting. Another possibility is that since the experimenter served as both the assessor and therapist, pre-to-posttest anger reduction could be influenced by a desire to please the therapist-assessor. Due to the lack of a control group which received no exposure, and experimentally blind assessors, analyses of these questions was not possible. The results, however, warrant exploration of exposure as an active treatment element. For a more in-depth discussion of the potential application of exposure models to the treatment of anger see Brondolo, DiGiuseppe, and Tafrate (1997).

Several factors may have limited the effectiveness of the REBT-based procedure. First, if exposure was an effective treatment component, then it would be difficult to detect meaningful differences caused by rational self-statement practice above and beyond what was achieved through repeated exposure and the resulting habituation effect. Second is the question of whether the intervention changed what the men believed about provocation. The cognitive portion of full-spectrum REBT is aimed both at specific belief change and a deep philosophical change regarding how people view the world. Ellis calls this "the elegant solution" (Waler, DiGiuseppe, & Dryden, 1992). Discussions about the functionality of particular beliefs, challenges to current irrational beliefs, collaboration between therapist and patient to develop new ways of thinking, and between-session cognitive homework assignments are central to REBT treatment. In the present analogue treatment study, however,

participants simply rehearsed statements provided by the experimenter. Increased beneficial results may have been achieved by the disputation of irrational beliefs and incorporation of other elements of REBT as is typically practiced (Waler, DiGiuseppe, & Dryden, 1992). In future studies, it is also recommended that a measure of irrational or rational belief endorsement be included to help clarify the role of thinking changes in anger reduction. A positive relationship would be expected between the degree of anger reduction and the degree of reduction in irrational thinking. Such a finding would increase support for the REBT model.

The possibility also exists that the present effects may be partially due to the fact that all treatments were conducted by the first author. Multiple therapists across and within conditions would help control for therapist characteristics and biases and would strengthen future examinations of REBT as a treatment for anger. In addition, since this was an analogue treatment study, a number of constraints limited the possibility of collecting follow-up data. Such data would be useful to help assess persistence of positive effects.

In summary, the results suggest that REBT-based intervention strategies have potential for the effective treatment of situational anger problems. They are worthy of further exploration with anger disordered adults who are functioning in the community. Future studies might increase the specificity of the triggers for each participant, include a cognitive disputation component, measure changes in irrational belief endorsement, have multiple therapists and blind assessors, and make other attempts to increase ecological validity. For example, a female experimenter might be used for men who experience anger with their wives or lovers. Or, for anger in response to the verbalizations of adolescents, an adolescent might be used to deliver the barbs. Based upon the present results, it also seems worthwhile to explore the utility of exposure-based methods as a treatment for anger. Finally, we note that our participants may not be similar to angry individuals who are incarcerated, institutionalized, or mandated for treatment and the degree to which these findings and procedures can be generalized to other types of patients remains unclear.

NOTE

[1]The Bryant-Paulson statistic is recommended to probe a significant ANCOVA. The formula (p. 354) and a table of critical values (p. 573) is provided by Stevens (1992). In the present study, a critical value of 3.49 was used for all post-hoc comparisons.

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