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Imaginal exposure for anger reduction in adult outpatients: a pilot study

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Abstract

Although exposure procedures have been widely accepted in the treatment of anxiety disorders, they have rarely been applied to the treatment of anger. The present paper describes an initial attempt to apply an imaginal exposure strategy to adult outpatients ($n = 6$) referred for anger management. This investigation reflects an empirical clinical practice approach rather than a controlled outcome study. Thus, this paper provides a clinical description of the imaginal exposure program, pre-to-posttest effectiveness data, an exploration of habituation patterns for each participant, and 15-month follow-up data from several patients. In considering the impact of the intervention, statistically significant change was found on most anger variables, the majority of patients met a criteria for clinically significant improvement on important indices of anger, and treatment effect sizes were large and compared favorably to previously studied interventions. Process data revealed a consistent habituation effect, across patients and anger stimuli, in response to repeated exposure practice. Participants' satisfaction was also positive. Finally, statistically significant and clinically meaningful change was evident at 15-months following the intervention. Data from the current pilot project are encouraging and hopefully will stimulate more methodologically rigorous clinical trials. © 2001 Elsevier Science Ltd. All rights reserved.

Although anger is an emotional problem frequently encountered in clinical practice (Lachmund & DiGiuseppe, 1997), its nature and treatment have received relatively little attention in the scientific literature (Kassinove & Sukhodolsky, 1995). As a clinical problem, anger has been associated with a number of serious negative consequences such as aggressive behavior (Cornell, Peterson, & Richards,

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1999; Deffenbacher, Oetting, Lynch, & Morris, 1996), family violence (Jacobson et al., 1994; Whiteman, Fanshel, & Grundy, 1987), substance abuse (DeMoja & Spielberger, 1997; Walfish, Massey, & Krone, 1990), and physical health problems (Helmert, Posluszny, & Krantz, 1994). It is therefore important that effective interventions be developed and studied. Unfortunately, at present, only a few treatment modalities have obtained any degree of empirical support. These modalities include relaxation, cognitive, and skills training interventions, as well as combinations of these three approaches. For quantitative reviews of the adult treatment outcome literature see Edmondson and Conger (1996) and Tafrate (1995). In addition to the small number of treatment outcome studies and the limited breadth of strategies examined, the majority of investigations have relied exclusively on undergraduate student volunteers (Tafrate, DiGiuseppe, & Parsi, 1997). This of course raises concerns about whether findings obtained in university settings, with students samples, can be generalized to the types of patients seeking anger treatment in everyday clinical practice or other types of service delivery settings.

The present study sought to evaluate the effectiveness of a novel treatment for anger in a small sample of patients referred to a community mental health center. Although exposure has been widely accepted as an active therapeutic element in treatment programs for anxiety disorders (Barlow & Craske, 1994; Craske, Barlow, & O'Leary, 1992; Foa & Rothbaum, 1998; Foa & Wilson, 1991; Markway, Carmin, Pollard, & Flynn, 1992), it has rarely been conceptualized and applied as an active intervention for anger reduction. However, there have been several investigations that have incorporated exposure procedures into treatment programs for angry subjects. In an investigation designed to evaluate the effectiveness of meditation and negative thought reduction for angry college students, Dua and Swinden (1992) utilized an unusual placebo condition in which subjects imagined high anger producing situations. It was found that the placebo (imaginal exposure) procedures were as effective in reducing anger as the other active interventions. Perhaps since this approach was considered to be a placebo, little information was provided on how the exposure intervention was implemented, and there was no discussion regarding reactions and habituation patterns of subjects.

In another treatment study, Tafrate and Kassonov (1998) exposed self-referred angry men to anger-provoking verbal barbs (in-vivo exposure) while they rehearsed rational (based on Ellis' Rational Emotive Behavior Therapy [REBT]; Ellis, 1962), irrational, or irrelevant self-statements. Although subjects who rehearsed self-statements based on the REBT model showed the greatest improvement, significant pre-to-posttest anger reduction was also observed for subjects in the other two groups. While the barb exposure was hypothesized to be the common effective treatment ingredient across all conditions, this study had not been designed to directly evaluate the effects of the exposure component. Finally, imaginal exposure procedures have been incorporated into relaxation interventions intended for angry subjects. For example in anger management training (AMT; Hazaleus & Deffenbacher, 1986; Suinn, 1990) relaxation skills are practiced in response to anger scenes developed by the client. Several meta-analytic reviews compared AMT to progressive

muscle relaxation alone and noted increased effectiveness in protocols that included imaginal anger scenes (Tafrate et al., 1997; Tafrate, 1995).

Several studies have also examined the effectiveness of systematic desensitization with angry clients. Standard systematic desensitization (relaxation and exposure to imaginal scenes) has been found to be effective for male college students who reported high anger while driving (Rimm, DeGroot, Boord, Heiman, & Dillow, 1971), white male college students who reported racial anger (O'Donnell & Worell 1973), and student nurses (Evans, Hearn, & Saklofske, 1973). In the O'Donnell and Worell study, it was also found that desensitization alone (in the absence of relaxation) was not effective. It is possible that the short number of exposure trials (five) was not sufficient to achieve habituation of anger responses. While results from these studies are encouraging, the use of student samples and the lack of standardized and rigorous anger measures raise questions about the effectiveness of systematic desensitization with clinical patients. Regrettably, no additional published research on this approach for anger has appeared since the early 1970s.

There has also been little written about the theoretical underpinnings of an exposure model of anger treatment. It has been proposed that the underlying mechanisms would be similar to those believed efficacious in the treatment of anxiety disorders (Brondolo, DiGiuseppe, & Tafrate, 1997). Clients with anger problems often report automatic-like responses to anger stimuli. It is conceivable that some types of anger problems arise through classical conditioning and are subsequently maintained through operant conditioning. Behaviors such as arguing, blaming others, and aggressive actions may result in temporary positive feelings and compliance by others. Such behaviors also constitute avoidance of negative emotions and do not allow for anger to extinguish. Repeated and prolonged exposure to an anger-evoking trigger, while preventing these usual response patterns, will interrupt and weaken the chain-of-events (perceptions, cognitions, physical arousal, & behaviors) linking a trigger to a response. In addition, exposure to the emotion itself, independent of the provocation, may also be useful in reducing feelings frequently associated with anger such as fear, resentment, shame, and hurt. As individuals habituate to their triggers they may become better able to tolerate the experience of anger and develop more flexible cognitive and behavioral responses to provocation.

The present study was undertaken to yield pilot data on imaginal exposure applied as an active and structured intervention, administered to a clinical sample, in a common service delivery setting. A secondary goal was to determine if the *process* of habituation in angry clients is similar to what has been observed in clients with anxiety disorders. The present study utilized a pre-to-posttest design with 6 subjects. The choice of design was guided less by stringent experimental considerations and more by real world clinical concerns (e.g. withholding of treatment for the purposes of establishing a comparison group or collecting baseline data was not considered feasible). Due to the small sample size and clear limitations inherent in the design, several approaches to judging the effectiveness of the intervention were selected including tests of statistical significance, an index of clinically significant and reliable change, effect size estimates, process data, and 15-month follow-up. For this reason

the current project represents an empirical clinical practice approach rather than the more traditional clinical trial.

1. Method

1.1. Participants

Participants were drawn from a pool of 25 referrals made to a community mental health center for anger management. Eligibility for the project was restricted to individuals over 18, who scored in the upper quartile (scores > 21) on the *Trait Anger Scale* (Spielberger, 1988). Eleven of the referrals had anger control problems that occurred exclusively during domestic disputes and were directed to an already existing domestic violence program. Six of the referrals did not meet the anger criteria, and two preferred individual treatment. Thus, 6 adults (five males and one female) participated in the present program. Four of these patients were referred to the center by the county Court system, one by another mental health professional, and one client was self-referred.

The level of anger reported by the patients, as measured by pretest means on the *Trait Anger Scale* (Spielberger, 1988), indicated that this sample was angrier than 95% of normal adults ($M = 27.00$; $SD = 4.56$). Levels of anger were also higher than those reported for male prison inmates (Kroner & Reddon, 1995) and similar to treatment samples of angry adults (Tafrate & Kassinove, 1998) and college students (Deffenbacher & Stark, 1992; Deffenbacher, Thwaites, Wallace, & Oetting, 1994). The ages of the patients ranged from 24 to 45 ($M = 34.33$; $SD = 8.94$). Five were divorced, one was separated, and five had children. All were employed full-time and their self-reported yearly incomes ranged from \$18,000 to \$65,000 ($M = 32.67$; $SD = 18.95$). All participants were Caucasian and their years of education ranged from 12 to 16 ($M = 13.67$; $SD = 1.50$). Although the present program is focused on the emotion of anger (as a phenomenological/internal experience), four of the patients had been arrested at least once for aggressive behaviors such as brawling and assault. All reported significant negative consequences associated with anger related episodes (e.g. damage to family relationships, loss of romantic relationships, interference with work).

1.2. Measures

1.2.1. Norm-based anger measures

In order to make comparisons to other investigations in the treatment outcome literature and to calculate indices of reliable and clinical improvement (see results), portions of the State-Trait Anger Expression Inventory (Spielberger, 1988) were administered to patients at pretest and posttest. The *Trait Anger Scale* is designed to measure an individual's propensity to experience and express anger. This scale consists of 10 statements that describe subjective feelings of anger. In response to the sentence stem, "How I generally feel", participants rated on a 4-point Likert type

scale (1 = almost never to 4 = almost always) how characteristic each item was for them. Higher scores indicate greater general anger. This scale has been shown to be internally consistent ($\alpha = 0.82$; 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). Modes of anger expression (e.g. the tendency to generally hold anger in, to express anger outwardly, or to remain calm and control anger) were assessed by the *Anger Expression Scale*. This self-report measure consists of three 8-item subscales (*anger-in*, *anger-out*, and *anger-control*) on which participants were asked to rate, on a 4-point Likert type scale (1 = almost never to 4 = almost always), the degree to which each statement described how they expressed themselves when angry. Higher scores reflect greater tendency to engage in that particular mode of expression. The anger expression scales have internal consistency reliabilities that range from 0.73 to 0.84, 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).

1.2.2. Idiographic anger measures

In order to obtain a measure of each participant's anger in relation to a specific real life situation, an idiographic assessment strategy was adapted from Hazaleus and Deffenbacher (1986) and more recently Deffenbacher, Dahlen, Lynch, Morris, and Gowensmith (2000). Each participant was asked to identify the ongoing situation associated with the greatest feeling of anger. In response to that situation, ratings were obtained on the following anger dimensions at pretest and posttest: (a) anger intensity (0 = little or no anger, 100 = maximum level of anger ever experienced), (b) frequency (number of times anger had been experienced in that situation in the past month), (c) duration (the number of minutes that anger usually lasted), (d) the degree to which anger in the situation interfered with the persons functioning (0 = no interference, 100 = extreme interference), and (e) the intensity of the strongest anger related physical sensation experienced in the situation (0 = no symptoms, 100 = extremely severe symptoms). As reported by Deffenbacher et al. (1996), intensity ratings for the most salient ongoing anger situation have a 10-week test-retest reliability of 0.81 and correlate positively with other anger measures.

1.2.3. Process measures

The Daily Anger Exposure Record was created by the authors as a method of structuring and documenting patients exposure practice.¹ For each exposure trial, patients indicated the anger scene content, the time that the exposure trial began and ended, physical sensations that occurred during exposure, and anger intensity ratings in response to the scene (0 = none, 8 = extreme). Anger intensity ratings are similar to the subjective units of distress scale (SUDS) commonly used in imaginal exposure

¹Requests for copies of the Daily Anger Exposure Record should be addressed to Raymond Chip Tafrate, Ph.D., Department of Criminology & Criminal Justice, Central Connecticut State University, 1615 Stanley Street, New Britain, CT 06050; e-mail: tafrater@ccsu.edu.

procedures for clients with anxiety disorders. Patients provided anger ratings at two points during each trial, after the first minute and at the end of the one half-hour trial.

Since reports of imaginal exposure are relatively new to the anger treatment literature, it was unclear how patients would react to the procedures. Potential concerns included patients not understanding the rationale for exposure practice, lack of rapport with the group leader, and dissatisfaction with the treatment protocol. Therefore, the client form of the *Working Alliance Inventory* (WAI; Horvath & Greenberg, 1989) was administered at posttest. This 36-item questionnaire contains three subscales; clients' perception of *agreement on goals*, perception of *agreement on tasks*, and the formation of a *bond*. Participants rated on a Likert type scale (1 = never to 7 = always) the degree to which each item reflected the alliance between themselves and the group leader during the course of treatment. Alpha reliabilities have been reported to range from 0.75 to 0.91 for an adult sample of angry men, suggesting good internal consistency (Tafrate & Kassino, 1998). Low scores on the WAI have been associated with poor outcome and premature termination while higher scores have been associated with good treatment outcome (Samstag, Batchelder, Muran, Safran, & Winston, 1998).

1.2.4. Norm-based measures of other emotional disturbance

Measures of anxiety and depression were also included to assess the potential impact of treatment on non-targeted emotional issues. Decreases in both anxiety and depression have been noted in several anger studies (Deffenbacher et al., 2000; Deffenbacher & Stark, 1992). On the 21-item *Beck Depression Inventory-Second Edition* (BDI-II; Beck, Steer, & Brown, 1996) participants rated the severity of depressive symptoms experienced during the previous week. The BDI-II has alpha coefficients that range from 0.92 to 0.93 and correlates positively with the original BDI, other measures of depression, as well as measures of hopelessness and suicidal ideation (Beck et al., 1996). On the 21-item *Beck Anxiety Inventory* (BAI; Beck & Steer, 1993), participants rated the severity of cognitive and somatic symptoms of anxiety experienced during the previous week. Alpha coefficients for the BAI range from 0.92 to 0.94 and the BAI has been shown to correlate positively with other measures of anxiety (Beck & Steer, 1993).

1.3. Procedure

Individuals referred to the clinic for anger management met individually with the first author for an initial screening session. The Trait Anger Scale was administered and those who met the criteria for participation completed an intake form, an informed consent form, and all additional anger measures. Those not eligible or who did not wish to participate in the experimental treatment were referred to other programs. The intervention under investigation was administered as it would be in clinical practice and participants paid a fee for the services they received. Fees were set based on a standard group therapy fee schedule for the geographic area. The clinic also provides a discounted fee schedule based on household income which is

frequently used to provide services to those who otherwise would be unable to afford them. If the client wished, at the end of the project, a more standard anger intervention would be provided at no additional cost.

Following the initial screening, a wait-list of eligible participants was created until six people were available to form a treatment group. This resulted in a wait-list period for three of the patients that ranged from 6 to 15 weeks. The three other patients were screened within seven days of the start of the program. Wait-listed clients completed all outcome measures during the initial screening and again at sessions one and two. All the treatment sessions were conducted in a group format by the first author. Once formed, the group met once a week for 90-min. In the case of a missed group meeting, the patient simply returned the following week. Another real world consideration was clinic resources. Therefore, the purpose of the group meetings was to structure the intervention and to provide feedback to the patients. The actual exposure practice trials were conducted by the patients at home. The first author administered all assessment instruments.

1.3.1. Treatment outline—session 1

Patients introduced themselves and gave a brief overview of the history of their anger problems. The importance of data collection was explained and the norm-based measures of anger, anxiety, and depression were completed.

1.3.2. Session 2

The idiographic measures of anger were completed. Patients were guided through a discussion of their most distressing ongoing anger situation. Client responses produced specific details that could later be used in scene development. The therapist introduced the concept of repeated exposure practice as a method of reducing emotional arousal in response to anger triggers. Visualization was also introduced. Clients were given several pleasant scenes to visualize in order to gain familiarity and practice with these procedures.

1.3.3. Session 3

The therapist repeated the rationale for the systematic use of imaginal exposure. Guidelines for scene development were provided and participants began to write their scenes. In turn, each patient read his/her initial composition aloud while the other group members practiced visualization. This was done to provide additional visualization practice and also allow group members to give each other feedback with regard to the detail and content. Homework was to rewrite the scenes, for the next group meeting, incorporating the feedback received from other group members and the therapist.

1.3.4. Session 4

The rationale for the exposure model was again repeated. The homework was reviewed by having each patient in turn read his or her improved scene while the other group members practiced imagining themselves in the situations presented. Final suggestions were made for each of the scenes and remaining questions about

imagery were addressed. The Daily Anger Exposure Record was then introduced and explained. Once at home, patients were to record their scenes on an audiotape, listen to the tape for one trial of at least 30-min per day, and complete the exposure record. Since the use of exposure is new to the anger literature, and we were uncertain how clients would react, it was decided to keep the exposure trial interval to one half-hour.

1.3.5. Session 5

This session began with a review of the audiotape and Anger Exposure Records for each patient. Each patient played his/her audiotape in order to receive feedback from other group members and the therapist. Adjustments were made to each scene as necessary. At this point in the program clients made modifications on their scenes and engaged in exposure assignments based on their individual experiences and progress. For example, one patient revised his tape to include more details, another continued to review the original scene, and the four other patients created a variation on their original scenes called “going to extremes”. This required clients to create a version that exaggerated negative events. All patients continued to review their audiotaped anger scenes for one trial, 30 min each day, and to complete the Anger Exposure Record.

1.3.6. Sessions 6–9

Sessions began with a review of the previous weeks records followed by a discussion of experiences with the exposure practice. Again, depending on progress, patients would revise scenes, make extreme scenes, or move on to second anger situation. Continued exposure practice was assigned at the end of each meeting. Over the course of treatment, each participant applied the exposure strategy to two anger situations.

1.3.7. Session 10 (assessment)

The norm-based anger measures, idiographic anger measures, norm-based measures of anxiety and depression, and the WAI were completed. Subjects discussed their progress and future plans.

Fifteen months posttreatment, participants were sent the Trait Anger Scale, Anger Expression Scales (anger-in, anger-out, anger-control) and a stamped return envelope. In addition, a brief description of each participants' initial anger situation was provided, along with a rating scale, on which patients rated their current level of anger intensity.

2. Results

2.1. Course of anger left untreated

As noted earlier, following the initial screening, three individuals experienced a wait list period. Visual inspection of the baseline and pretreatment means on trait

anger ($M_{\text{baseline}} = 21.67$, $SD = 1.15$; $M_{\text{pretreatment}} = 26.33$, $SD = 4.93$), anger-in ($M_{\text{baseline}} = 20.67$, $SD = 6.11$; $M_{\text{pretreatment}} = 17.33$, $SD = 4.51$), anger-out ($M_{\text{baseline}} = 15.67$, $SD = 3.51$; $M_{\text{pretreatment}} = 17.67$, $SD = 2.52$), anger-control ($M_{\text{baseline}} = 19.00$, $SD = 6.08$; $M_{\text{pretreatment}} = 19.33$, $SD = 6.81$), anger situation intensity ($M_{\text{baseline}} = 80.00$, $SD = 21.21$; $M_{\text{pretreatment}} = 79.50$, $SD = 27.58$), and anger situation frequency ($M_{\text{baseline}} = 12.50$, $SD = 16.26$; $M_{\text{pretreatment}} = 30.00$, $SD = 18.21$) indicate that left untreated, patients did not spontaneously remit and that the course of the clinical anger problem tended to remain stable or worsen over time. Exceptions are noted on measures of anger situation interference ($M_{\text{baseline}} = 80.00$, $SD = 14.14$; $M_{\text{pretreatment}} = 59.00$, $SD = 55.86$) and anger sensation intensity ($M_{\text{baseline}} = 70.00$, $SD = 42.43$; $M_{\text{pretreatment}} = 57.59$, $SD = 31.82$), which indicated some improvement. Mean baseline scores for anger situation duration could not be calculated due to missing data.

2.2. Treatment effects and outcomes

Several approaches to judging the effectiveness of the intervention were employed. The outcomes of these procedures along with the pretest and posttest means and standard deviations are summarized in Table 1.

Statistically significant improvement was assessed for the sample as a whole with the Wilcoxon Signed-ranks test. Due to the preliminary nature of this study, alpha was set at $p < 0.05$ for all planned comparisons. At the end of treatment patients reported significantly less trait anger, less anger-in, and fewer outward expressions of anger (anger-out). While improvement is noted for controlled expression (anger-control) these results did not reach statistical significance. In terms of the most troublesome ongoing anger situation, significant reductions were reported for anger intensity, anger duration, physiological arousal, and life interference. Improvements on anger frequency were not significant. Reductions on anxiety and depression are also noted, however, they did not reach significance. Overall, 11 hypotheses were tested. The p -values obtained were rather small, many less than 0.05, and most less than 0.10. This pattern suggests that patients experienced improvement. If patients had not benefited from the program, more p -values in the range of 0.20–1.00 would have been expected.

The *magnitude of improvement* over time was assessed for the entire sample by calculating pre-to-posttest effect sizes (d) for each outcome measure. Effect sizes were computed by dividing the difference between the pretreatment and posttreatment means by the standard deviation of the pre to posttreatment difference scores. According to Cohen (1977), for psychotherapy outcome research, effect sizes of 0.5 are considered moderate and those over 0.8 are considered large. Inspection of Table 1 shows large treatment effects for all the anger measures, except anger control, which yielded a moderate effect. A large treatment effect is also noted for depression and a moderate effect was obtained on anxiety. While these results also provide support for the effectiveness of the intervention, it should be noted that with only six subjects effect sizes are sensitive to outliers.

Table 1

Pre-to-posttest means, standard deviations, and outcomes for the 6 patients^a

Measures	<i>M</i>	<i>SD</i>	Wilcoxon Signed-ranks <i>z</i> -value	<i>p</i> -value (one-tailed)	Effect size (<i>d</i>)	No. of patients showing clinically significant improvement
<i>(a) Norm based anger measures</i>						
<i>Trait anger</i>						
Pretest	27.00	4.56				
Posttest	17.17	2.86	2.20	0.014	2.20	5
<i>Anger-in</i>						
Pretest	18.67	3.39				
Posttest	12.83	2.14	2.00	0.023	2.52	5
<i>Anger-out</i>						
Pretest	22.00	6.10				
Posttest	14.17	1.94	2.21	0.014	1.14	2
<i>Anger control</i>						
Pretest	16.50	5.39				
Posttest	20.83	4.96	1.36	0.089	0.57	3
<i>(b) Idiographic anger measures</i>						
<i>Anger situation intensity</i>						
Pretest	79.83	20.79				
Posttest	15.83	15.63	2.20	0.014	2.06	5
<i>Anger situation frequency</i>						
Pretest	14.00	14.03				
Posttest	2.00	1.67	1.48	0.069	0.82	U
<i>Anger situation duration</i>						
Pretest	27.50	19.94				
Posttest	6.67	11.69	2.06	0.019	0.97	U
<i>Anger situation interference</i>						
Pretest	61.50	44.74				
Posttest	7.50	9.87	1.99	0.029	1.17	U
<i>Anger sensation intensity</i>						
Pretest	71.67	31.09				
Posttest	17.00	11.14	2.02	0.022	1.61	U
<i>(c) Norm based measures of other emotional disturbance</i>						
<i>Beck depression inventory</i>						
Pretest	15.33	12.86				
Posttest	4.83	5.27	1.58	0.058	0.85	4
<i>Beck anxiety inventory</i>						
Pretest	16.17	14.30				
Posttest	6.17	5.19	0.94	0.173	0.60	3

^aNote. *U* = unable to compute due to the lack of normative data and reliability estimates. Non-clinical norms for the BAI were not available in the technical manual and were obtained from Dent and Salkovskis (1986).

Clinically significant improvement for each patient was evaluated according to the criteria proposed by Jacobson and Truax (1991). Improvement is considered to be clinically significant when (a) a patient's score moves from the dysfunctional to the

functional range, and (b) when change is of sufficient magnitude to rule out random fluctuations in measurement. In order to meet the first criteria, a patient's posttest score had to be closer to the M of a well functioning population (as identified in the technical manual) than the dysfunctional population (pretreatment M for the current sample). To meet the second criteria, a patient's pre-to-posttest change divided by the standard error of difference between the two scores had to exceed 1.96. The standard error of the difference was calculated by using the pretreatment standard deviation and Cronbach's coefficient alpha as the reliability estimate (Tingey, Lambert, Burlingame, & Hansen, 1996). These analyses were not performed on the idiographic measures, with the exception of anger intensity, because normative data and reliability estimates were unavailable. Clinically significant improvement was calculated for anger intensity using the Deffenbacher et al. (1996) estimate of test-retest reliability and was achieved when a posttreatment score moved at least two SDs , in the direction of improvement, from the pretreatment M for the sample as a whole. It should be noted that there is some debate regarding the conceptual usage and mathematical calculation of clinically significant change. These issues are discussed in detail elsewhere (Follette & Callaghan, 1996; Jacobson, Roberts, Berns, & McGlinchey, 1999; Kazdin, 1999; Speer, 1992; Williams & Zimmerman, 1996).

Inspection of Table 1 reveals that on the norm-based anger measures, five of the six patients showed clinically significant change on the trait anger and anger-in. Half of the sample exhibited clinically significant improvement on anger control and two patients moved into the normal distribution on anger-out. Five patients reported clinically significant reductions in anger in response to their most serious ongoing real life anger situation. In terms of non-anger measures, approximately half the sample exhibited clinically significant decreases in symptoms of depression (four) and anxiety (three).

2.3. Process measures

2.3.1. Habituation patterns

Fig. 1 shows anger intensity ratings after each trial of exposure practice for all 6 patients. Each box (two per participant) represents a distinct anger situation to which exposure procedures were applied. The number of practice trials performed for each situation and the timing of changes in scene content (revised or extreme) varied from client to client. For imaginal exposure to be an active therapeutic element responsible for the pre-to-posttreatment improvements, a pattern of consistent and observable decreases on anger scores would be expected following repeated exposure trials. Visual inspection of the graphs confirms this general pattern, referred to as habituation.

Specifically, in response to the first situation, *patient #1* showed an initial increase in anger ratings followed by a steady decline over the course of 21 exposure trials. For the second situation, each change in scene content resulted in an initial increase in anger scores followed by immediate anger reduction. *Patient #2* exhibited a similar pattern for both situations. Anger ratings tended to increase with each change in

scene content and decline with repeated rehearsal. Dramatic and rapid decreases in anger ratings are evident for *patient #3's* responses to the first situation. On the second situation, anger ratings started very high and decreased over the course of 15 exposure trials resulting in consistent low ratings for the last five trials. *Patient #4's* results for the first anger situation were less positive. Although some improvement is noted, his anger remained relatively high at trial 15. Further decreases may have been achieved with more trials. A favorable response, however, was achieved on the second situation. Although *patient #5* attended the majority of group meetings, he did not consistently record his at-home practice. This lack of documentation and very low initial anger ratings, where high ratings were expected, brings into question

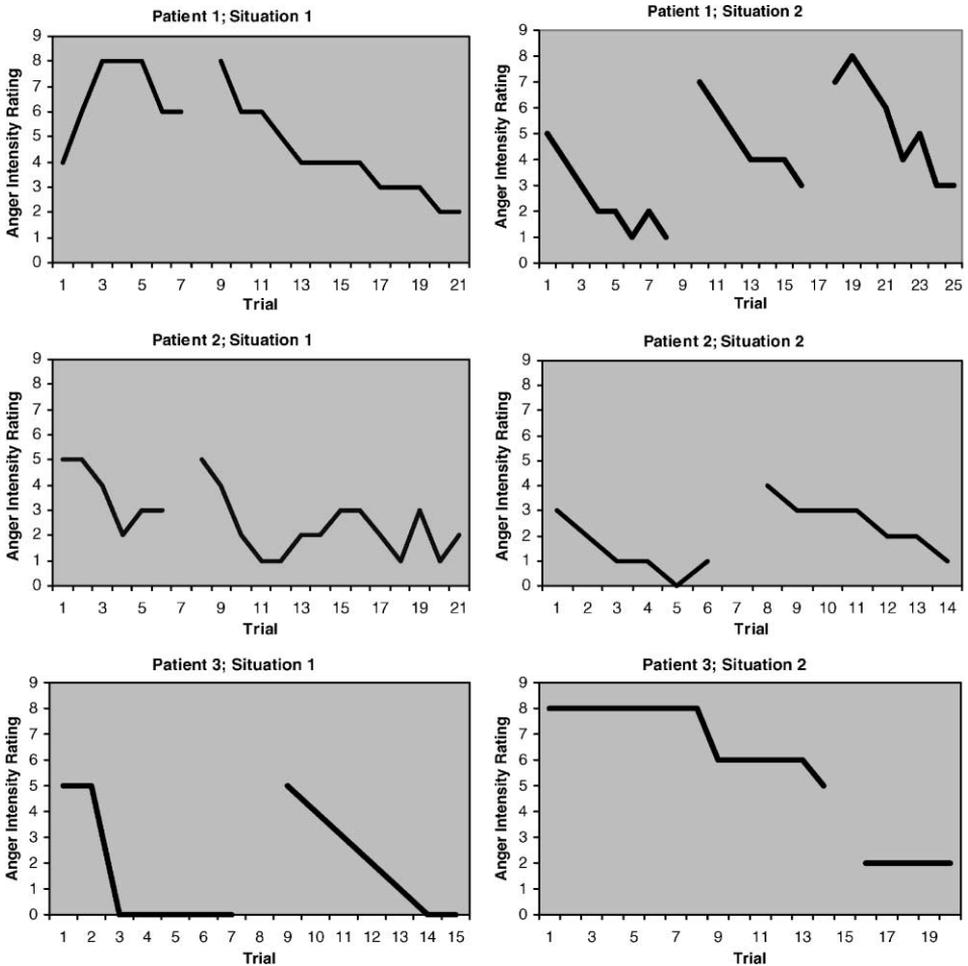


Fig. 1. Subjective ratings of anger intensity after each exposure practice trial. Boxes represent distinct anger situations and breaks in the line indicate a shift to a revised or extreme version of the same situation.

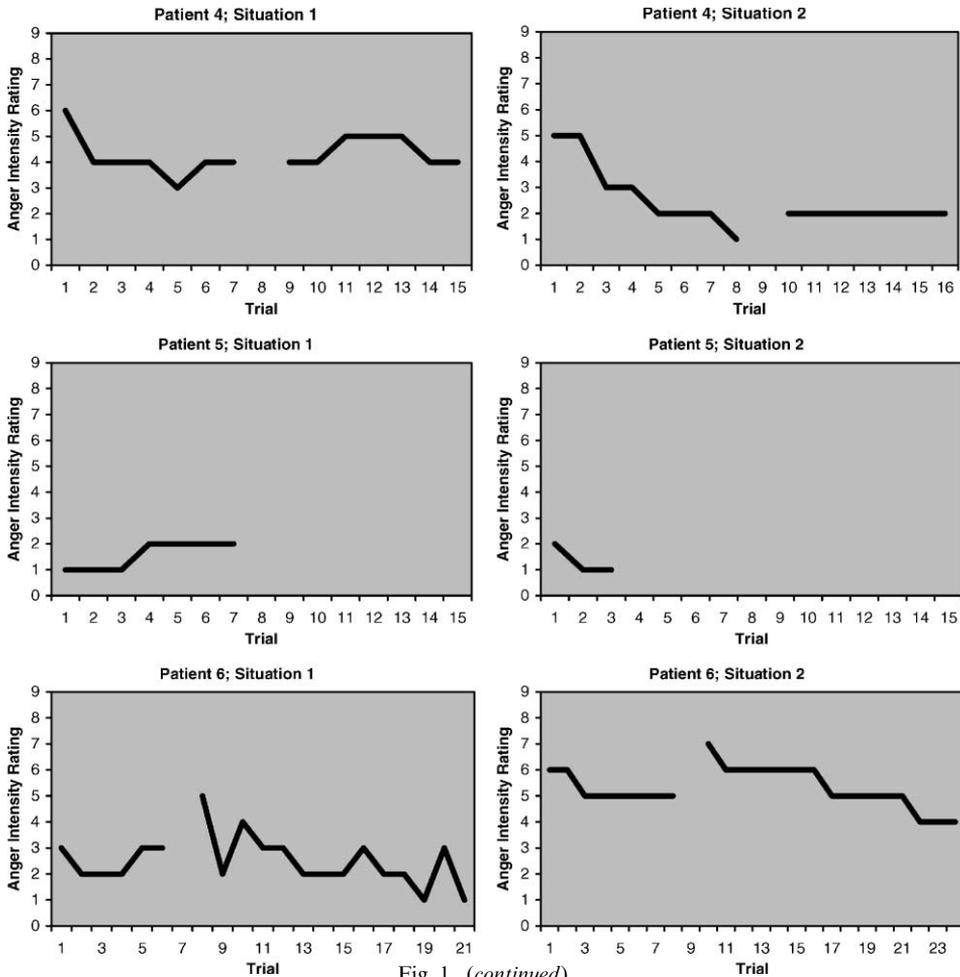


Fig. 1. (continued).

the degree to which this patient followed the exposure protocol. *Patient #6's* anger ratings for the first situation were not very high. Nonetheless, decreases are still evident over the course of 21 exposure trials. On the second situation, steady declines were achieved over 24 trials. However, his anger ratings remained relatively high. Further decreases might have been attained with more practice.

In addition to rating anger intensity at the end of each 30-min exposure trial, patients also rated their anger 1-min into each trial. The *M* score for all practice trials for all six subjects (based on 198 exposure records) at the 1-min interval was 3.53 and the *M* at the end of the trials was 3.13. This represents a within trial anger decrease of less than one half a point on a 0–8 scale. Such a small per trial decrease indicates that habituation effects tended to occur over repeated trials and not within trials. Increasing the length of the exposure practice sessions, or having patients rate

their anger at its peak, rather than after 1-min, might have resulted in greater reported within trial anger reductions.

2.3.2. Patient satisfaction

Overall, session attendance was good. Four patients attended all 10 meetings. Patient #5 missed two of the sessions and patient #1 missed one session. At the end of the exposure protocol, the group leader offered to set up a more traditional cognitive-behavioral program for those who believed that they did not benefit substantially. All 6 patients reported satisfaction with the current program and did not wish to pursue another intervention.

On the WAI, ratings of the perceived alliance between each participant and the group leader ranged from 5.33 to 6.83 ($M = 6.40$; total score). Ratings for agreement on goals ranged from 5.75 to 6.83 ($M = 6.39$), agreements on tasks 4.68 to 7.00 ($M = 6.40$), and formation of a bond 5.88 to 6.75 ($M = 6.47$). Scores of 4.5 or less are considered to indicate problems in the therapeutic alliance and predict premature termination (Samstag et al., 1998). Scores from the current project are high (all over 4.5) and indicate an acceptable alliance with the group leader and a positive treatment experience for each patient.

2.4. Long-term outcomes

Three patients (50%) returned data at 15-month follow-up. The three non-respondents had either moved out of the geographic area or failed to reply to repeated mailings. A series of Mann-Whitney U tests were conducted on pretest and posttest scores to explore possible differences between patients who provided follow-up data and those who did not. No significant differences were found, indicating that patients who provided follow-up information were representative of the sample as a whole in terms of their initial anger scores and their responses to treatment. Visual inspection of the means for the three patients appears to indicate sustained improvement on all anger measures for which follow-up data were collected (see Table 2). Statistically significant results were maintained for trait anger, anger-out, and anger situation intensity. Results for anger-in and anger control were non-significant. Effect sizes indicate that moderate to large improvements were maintained and the majority of patients continued to show clinically meaningful and reliable change on all measures except anger-out.

3. Discussion

This investigation was an initial attempt to apply an imaginal exposure strategy to angry clients. It represents one of many possible ways of using exposure procedures to reduce anger. The present investigation differs from most others in the anger treatment literature in that the participants were actual clinic referrals and the treatment was administered, as it would be in real clinical practice. Although most of our patients had histories of aggressive behavior, the focus of the present program

Table 2
 Pretest, posttest, and fifteen-month follow-up means, standard deviations, and outcomes for 3 patients^a

Measures	<i>M</i>	<i>SD</i>	Friedman test $\chi^2(2)$	<i>p</i> -value (one-tailed)	Effect size (<i>d</i>)	No. of patients showing clinically significant improvement
<i>Trait anger</i>						
Pretest	29.00	5.19				
Posttest	18.67	3.52				
Follow-up	19.67	3.06	5.64	0.030	1.69	2
<i>Anger-in</i>						
Pretest	18.00	4.58				
Posttest	13.33	2.31				
Follow-up	14.00	3.46	0.55	0.381	0.64	2
<i>Anger-out</i>						
Pretest	20.67	7.37				
Posttest	13.67	2.89				
Follow-up	14.33	1.53	4.67	0.048	0.84	1
<i>Anger control</i>						
Pretest	17.67	8.14				
Posttest	22.33	4.93				
Follow-up	23.33	1.53	0.68	0.359	0.67	2
<i>Anger situation intensity</i>						
Pretest	86.33	22.81				
Posttest	13.33	15.28				
Follow-up	6.67	11.55	5.64	0.030	3.98	3

^a Note. Clinically significant improvement and *d*'s based on comparisons between pretest and follow-up scores.

was to reduce the subjective (internal) experience of anger. Thus, measurements were obtained on a variety of self-report dimensions including both normative and person specific outcomes. The impact of the intervention was judged from several perspectives. Statistically significant change and magnitude of change were assessed at the group level and clinically significant improvement was evaluated for each individual. Process data in response to exposure practice trials were also obtained for each patient. In addition, long-term treatment effects were examined for several patients.

In spite of the small sample size, statistically significant change was reached on seven out of the nine anger measures. On normative measures, patients showed decreases in trait anger, anger-in, and anger-out. In regards to a personal and provocative ongoing situation, patients reported lowered anger intensity, shorter duration of reported angry feelings, fewer physical sensations, and less interference with everyday functioning. While there appeared to be some generalization to other emotional problems (e.g. anxiety and depression), these results were not significant at the group level.

The magnitude of change also appeared clinically meaningful. Treatment effect sizes were in the large range on all anger variables except anger control. A large

treatment effect was also found for depression and a moderate effect for anxiety. A number of other interventions studied in the anger treatment outcome literature have also yielded large effect sizes.² For example, using *trait anger* as a comparison variable, self-instructional training obtained a pre-to-post effect size of 1.31 (Deffenbacher, Story, Brandon, Hogg, & Hazaleus, 1988), Beck's cognitive therapy 1.73 (Deffenbacher et al., 2000), social skills training 0.99 (Deffenbacher et al., 1994), problem solving 1.31 (Deffenbacher et al. (1994)), group process 1.17 (Deffenbacher, McNamara, Stark, & Sabadell, 1990), anger management training 2.39 (Deffenbacher & Stark, 1992), and a combined cognitive-relaxation intervention 1.82 (Deffenbacher & Stark, 1992). The current program, with an effect size of 2.17 for *trait anger*, compares reasonably well to other interventions. The only intervention that produced a higher pre-to-posttreatment effect size was Anger Management Training (AMT; Deffenbacher & Stark, 1992) which also utilizes imaginal exposure procedures.

At the individual level, clinical significance was attained when a patient's posttest score was not distinguishable from a non-disturbed reference group and when the change was of a sufficient magnitude to be reliable. The majority of participants (five) showed a degree of improvement that would be classified as clinically significant on three out of the five anger measures for which this criterion was applied. This occurred for the variables of trait anger, anger-in, and anger in response to the most troublesome real life situation. Half the sample (three patients) showed movement into the functional range for controlled expressions of anger (anger-control) and only two reached clinical significance on anger-out. The test may not have been appropriate for the anger-out variable given high degree of variability at pretest resulting in a large standard error of measurement. Four patients reported clinically significant change on depressive symptoms and three for anxiety related symptoms.

In considering the various methods of assessing improvement, imaginal exposure appeared to be an effective intervention for the majority of the patients on many important indices of anger. As expected, the intervention seemed to have less impact on symptoms of anxiety and depression. Nonetheless, some degree of improvement is noted in these areas, which is consistent with other reports found in the treatment outcome literature. One potential explanation is that anger reduction contributed to better overall functioning resulting in fewer triggers for anxiety and depression.

The process data suggests that one patient (subject #5) did not adhere to the exposure protocol. An inspection of the outcome data for this patient revealed that he failed to achieve clinical significance on most of the anger measures. Given that there were only 6 participants, this tainted the group results somewhat. Nonetheless, this case raises an important treatment issue. The current program required active

²For comparison purposes, pre-to-posttest effect sizes (*d*) were calculated by the authors, from data provided in published reports. Effect sizes were computed by dividing the difference between the pretreatment and posttreatment mean by the pooled standard deviation of both scores. These calculations were performed with the D-STAT program (Johnson, 1989), which also provides an adjustment for sample size.

daily participation from each client. Exposure procedures may be best suited for those individuals who are sufficiently motivated and willing to comply with between session assignments. As noted by other researchers, building motivation for change may be a critical issue when working with angry adults (DiGiuseppe, Tafrate, & Eckhardt, 1994).

For the remaining five participants, process data indicated consistent and observable decreases in anger on 9 of the 10 situations for which scenes were created and rehearsed. Only patient #4 failed to show a reduction in anger for the first situation. Although baseline data for each participant would have been useful for interpreting change and ruling out extraneous variables, given the real world concerns of the patients, treatment was not delayed for this purpose. As noted earlier, baseline data on anger outcome measures, including the most serious ongoing anger situation, from which the first anger exposure scenes were developed, was obtained from three clients awaiting treatment. This data provided some basic information regarding the course of clinical anger in the present sample and revealed that anger situation intensity ratings remained stable and unchanged after several weeks of no treatment. Once the intervention was applied, decreases in anger ratings for the first situation were noted. Exposing patients to a second anger situation then replicated these results. The overall pattern of change is consistent with a habituation effect and is supportive of the role of exposure as an active therapeutic element. Based on a visual inspection of the graphs, it appears that the process of habituation in angry clients is similar to what has been observed in clients with anxiety disorders.

Several other patterns emerged from the process data. All patients who adhered to the protocol showed an initial increase in anger when moving from the first anger situation to the second. Generalization between situations may not occur naturally and therefore it may be important to repeatedly expose clients to all of their major anger triggers. In addition, some clients exhibited initial increases when confronting a revised or extreme version of the same situation. Such increases generally appeared short-lived and decreases were noted within one or two trials. In the present program, decisions about when to make a change in scene content or situation were client driven. Patient boredom was often the main reason for making a shift. A stronger habituation effect might have been achieved by continuing with the same scene for more trials. Perhaps a better way to guide decisions about shifts to new scenes is to utilize an empirical criterion, such as three trials with anger ratings of less than two.

Average anger ratings within trials indicated that very little change occurred during the one half-hour exposure practice sessions. It appears that habituation occurred over repeated trials but not within trials. The trial length may have been too short for anger arousal to subside, and greater within trial decreases may have been achieved with a massed practice approach (Levis, 1980). Small within trial habituation effects might also be due to way in which measurements were recorded. Rather than have patients rate their anger 1-min into a trial, larger decreases might have been observed had patients rated their anger at its peak. Further empirical work should focus on evaluating the habituation process in terms of optimal trial length and number of rehearsals.

Participant satisfaction with the present program was high as suggested by good attendance and WAI scores. Patients appeared to understand the rationale for engaging in repeated exposure practice and did not report any adverse affects. Although patients had a variety of anger triggers, imaginal exposure procedures were easily adapted to a group format. The role of the group leader in the present program was to obtain assessment information and to provide structure and feedback. Patients conducted most of the exposure practices on their own outside of the group sessions. It is possible that this intervention could be structured in a manual and presented in a self-help format. Additional research with other types of clients with anger problems would be useful in identifying any contra-indications for the use of exposure procedures.

Finally, statistically significant and clinically meaningful change was evident at 15-months following the intervention. In comparing posttest and follow-up scores (Tables 1 and 2), statistically significant improvement was maintained on trait anger, anger-out, and anger situation intensity. Although effect sizes decreased on several measures, gains were still in the moderate to large range at the end of the follow-up period. As was the case at posttest, clinically significant and reliable change was also observed at follow-up for the majority of patients on all measures except anger-out. Persistence of treatment effects was observed on both normative and person specific measures. Patients reported continued improvement for the situations that were specifically addressed in the exposure program, as well as for general anger experiences.

While administering the treatment in a community mental health center to actual anger referrals added to the ecological validity of this investigation, it also contributed to a number of limitations. Our methodology did not allow for a comparison between patients treated with exposure to a similarly referred group of anger patients that received no treatment or some other intervention, for the same period of time. Therefore, the present findings should be interpreted with caution. A supportive relationship among the patients, praise and positive feedback, increased awareness of anger reactions, and wanting to please the therapist-assessor may have all contributed to the observed improvements. Replication of the present results is certainly needed. Better experimental control is required to rule out a number of important threats to internal validity inherent in this pilot project and allow for stronger causal inferences.

In spite of the obvious limitations, the present study indicates that imaginal exposure can be applied to adults with clinical anger problems. Preliminary results provide encouraging suggestive evidence that imaginal exposure may be an effective intervention. The development of a comprehensive exposure model of anger treatment requires a far greater understanding of the process of habituation in angry clients than now exists. Future researchers may wish to investigate the relationship between exposure trial length and habituation, optimal number of trials required for anger reduction to a specific stimulus, and generalization across anger situations. Exposure-based procedures certainly warrant further exploration as an anger reduction strategy.

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