Treatment of Flying Phobia: Comparative Efficacy of Two Behavioral Methods

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In this naturalistic study, 50 men and women with flying phobia were matched in pairs for pretest flying anxiety level and randomly assigned to systematic desensitization or implosion therapy. After 5 min of exposure to the most realistic of preflight conditions, they completed a state anxiety questionnaire. This experience was repeated after 4 therapy sessions. The anxiety of both groups declined, but the decline was steeper for the implosion therapy group. Widespread application of this rapid and cost-effective treatment is recommended.

According to Woodward (1992), approximately 32.5 million Americans are afraid of flying to some degree. This commonplace fear is sufficiently strong to rule out the option of air travel for close to 15 million people (Abramson, 1993). Aside from the effects that this has on the lifestyle, recreational opportunities, and job requirements of these individuals, it represents a loss to airlines and their affiliates of $13.5 billion annually (Abramson, 1993). It is not our goal here to speculate about the ultimate causes and origins of flying phobia. A comprehensive summary of the various causal factors has been provided by deSousa and Loring (1987). Just as there are multiple causes, there is no single preferred treatment modality. Psychoanalytic (Pryczk, 1988), interpersonal (Ellsworth, 1994), rational emotive (Megwarthy, 1990), multimodal (Glauber, 1993), existential (Eulith, 1992), behavioral (Logan, 1990), and hypnosis (Reznikoff & Belitsis, 1988) are among the approaches that have been tried with varying degrees of success. The purpose of the present study is to compare the effectiveness of two promising behavioral approaches: systematic desensitization and implosion therapy.

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NOTE: This is a fictional article to be used only for purposes of research education.

Systematic desensitization features the pairing of a hierarchy of images of the feared object or activity with relaxation techniques. When systematic desensitization is applied to fear of flying, clients are gradually advanced in imagery from visualizing going to an airport, entering the aircraft, strapping in, taking off, gaining altitude, cruising above the clouds, descending, and landing. At each stage, relaxation is induced until that particular activity can be contemplated in imagery without anxiety. When successful, clients are able to imagine flying without experiencing fear (Nagamo, 1988). In the implosion therapy approach, clients are directly confronted with images of their fears unaccompanied by positive or negative reinforcement. A series of the most frightening and horrible consequences are sequentially presented, as described by Eaglesberg (1987). They include such scenes as crashing on take-off, plummeting in a steep descent into the ground, looking out of the window and seeing an engine fall off, a mid-air collision with another airplane, fire and smoke on board, and spinning out of control into a shark-infested sea.

Method

Participants

Fifty participants, all of whom professed fear of flying on commercial airlines, were recruited for this study. All were volunteers who responded to newspaper advertisements offering

free treatment for their fear of flying in return for their participation in a research project. Participants were 18 men and 32 women between the ages of 21 and 65 years who lived in or around Chicago.

Each volunteer was seen individually for an initial interview to determine his or her suitability for the study. The research was explained in general terms, time requirements and scheduling were discussed, and those who were ready to make a commitment signed a consent form.

Assignment to Groups

Participants were assigned either to the systematic desensitization or implosion therapy condition following the formation of matched pairs based on pretest flying anxiety scores. A distribution of anxiety scores was prepared for men and for women. Two women who had approximately the same pretest scores were considered to be a matched pair. A coin flip decided which one was to receive systematic desensitization and which one implosion therapy. This was repeated until 16 pairs had been assigned. An identical procedure was followed with the male participants, yielding 9 pairs for assignment. Therefore, each treatment group had 25 participants matched in anxiety score to the 25 in the other group.

Criterion Measure

Flying anxiety was measured by the Mulhausen State Anxiety Scale (SAS; Mulhausen, 1989). This is a 10-item scale on which respondents are asked to tell how they feel at the moment. Each item is a 5-point Likert scale ranging from *not at all anxious* to *extremely anxious*, and the scores from the 10 items are summated to yield a total score. The Mulhausen SAS was standardized on 280 college students, ages 18 to 23 years. Convergent validity with the Chicago SAS was $r = .65$. Test–retest reliability after a 1-week interval was $r = .75$.

Procedure

A Boeing 717 was made available by Midwest Airlines for research purposes. The plane was berthed at O'Hare Airport, Chicago, IL. The aircraft was in its usual preflight mode in preparation for a scheduled flight. The airline dedicated 20 min for research purposes; the study did not interfere with its regular flight schedule.

The entire preflight experience and the preflight instructions are anything but soothing and reassuring. This is advantageous in a study on fear of flying. In the terminal, passengers are repeatedly admonished over the public address system not to leave luggage unattended so that terrorists will not have an opportunity to insert explosive devices. Pockets must be emptied, and passengers, along with their handbags and their carry-ons, are x-rayed in a search for concealed weapons or suspicious objects. Once on board, flight attendants tell passengers to sit upright and to fasten their seat-belts so as to prevent injury from being tossed about by air turbulence and to derive some small protective edge if the plane crashes. Flight attendants demonstrate how oxygen masks are used, and they assure everybody that these masks will drop down in front of their faces if there is a sudden loss of pressure. Passengers are warned not to smoke for fear that the oxygen will explode. The attendants demonstrate how to put on and inflate a life jacket should the pilot have to ditch the plane into the sea, point out the location of the nearest emergency exit in case of impending disaster, and (after all of this) welcome everyone to enjoy the flight. To those who are fearful of flying, this seems like more of a challenge than an invitation.

Participants in the study were ushered onto the airplane to assigned seats and were given the standard preflight instructions. As is customary, a check was made to make sure that seats were in an upright position and that seat belts were fastened. Shades had been drawn in all windows so that motion could not be visually detected. Engines were started and accelerated. After 5 minutes, participants were asked to lower their trays and to fill out the Mulhausen SAS, which had been placed in the flap of the seat in front of them. Following this, everyone deplaned and assembled in a lounge area that had been set aside. Refreshments were served, and individuals were told when and where to report for their treatment. One month later, following treatment, a second session that duplicated the first was held aboard the aircraft. The SAS was adminis-

tered in the same manner as it had been on the first occasion.

Treatment

Four half-hour weekly sessions of therapy were scheduled for each participant. Six therapists assisted in this study; all were advanced psychological interns who were trained and experienced in both therapeutic approaches. Half of each therapist's assigned clients were given systematic desensitization, and half received implosion therapy. Therapists closely followed procedures outlined in a prepared procedural manual for both types of intervention. All sessions were held at the Chicago Center for Behavioral Intervention (CCBI). Sessions were tape recorded and spot checked by supervisory personnel to ascertain compliance with the procedural manual. Participants who did not attend at least three of the four sessions and the final posttest were dropped from the study.

Results

At the first airport session, five people panicked while aboard the aircraft. Two of them ran for the front exit screaming "Let me out" and pounded on the locked door. The researchers and flight attendants held them, reassured them, and comforted them until the exercise was over. In addition, one participant passed out, one became ill and threw up, and one became incoherent and curled up on the floor. Of these five, none was able to complete the SAS, and they all withdrew from the study. Treatment was nevertheless offered to them, but none accepted. Four of them were scheduled to be in the implosion group, and one had been assigned to receive systematic desensitization. Three more participants did not attend the required number of treatment sessions and did not come for the postsession meeting. All eight individuals had to be dropped from the study, bringing the final sample to 42.

Data from the 42 participants who met the attendance requirements were analyzed in a 2 × 2 split plot analysis of variance. There were two orthogonal levels of treatment, systematic desensitization and implosion, and a repeated measure for time, with pretest and posttest levels. The dependent variable was score on the Mulhausen SAS. Obtained means are presented in Table 1.

Table 1
Pretest and Posttest Means of Two Treatment Groups

Group	Pretest	Posttest	Total
Desensitization (n = 24)	43.70	33.54	38.63
Implosion (n = 18)	34.17	18.44	26.31
Totals	39.62	27.07	

The analysis of variance (Table 2) reveals a significant reduction in reported state anxiety across time for both treatment groups combined, $F(1, 40) = 86.57$, $p < .0001$. The mean for the combined groups declined from 39.62 at pretest to 27.07 at posttest, as shown in Table 1. Although both groups experienced a diminution of anxiety, there was a significant Treatment × Time interaction, $F(1, 40) = 4.17$, $p < .05$. As illustrated in Figure 1, there was a steeper reduction in anxiety for the implosion therapy group than for the systematic desensitization group. The former dropped about 16 points in contrast to a 10-point reduction for the latter.

Discussion

The significant reduction in anxiety as a consequence of both treatments demonstrates the effectiveness of behavior therapy regardless of the specific form of the intervention. The results clearly show, however, that the two approaches were differentially effective, with a marked decline favoring implosion therapy. This study was not done in the artificial setting of a labora-

Table 2
Analysis of Variance Results of Flying Anxiety for Two Groups, Pretreatment and Posttreatment

Source	*df*	Sum of Squares	Mean Square	*F*
Treatment	1	3,122.099	3,122.099	30.749**
Subjects within groups	40	4,061.389	101.535	
Time	1	3,306.298	3,306.298	86.573**
Treatment × Time	1	158.730	158.730	4.165*
Time × Subjects within groups	40	1,524.472	38.112	

*$p < .05$. **$p < .0001$.

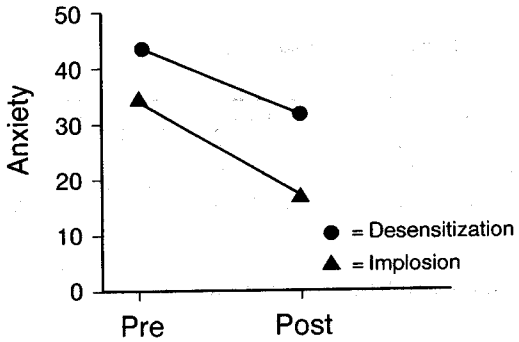

Figure 1. Mean anxiety scores by time and treatment.

tory or in an analog situation. People who were troubled by their flying phobia and who were motivated to seek help in gaining relief were exposed to a real-life situation that duplicated the feared situation in all respects save one. All elements of the prelude to flight were reproduced in their actual settings. Even though the aircraft never took flight, the realism of the experimental arrangement was sufficient to stimulate a high level of anxiety. The fact that five participants had overt panic reactions in the first session on board attests to this realism. The finding that implosion therapy in particular was successful in bringing down flying anxiety to a very manageable level after only four half-hour sessions is highly encouraging. In view of these findings, this rapid and cost-effective treatment merits widespread application.

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