

Psychological Intervention in Civilian Flying Phobia Evaluation and a Three-Year Follow-Up

C. P. WALDER, J. S. McCRACKEN, M. HERBERT, P. T. JAMES and N. BREWITT

Thirty-eight people with a moderate to severe degree of aerophobia self-referred themselves to a course designed to help them travel by air. The course involved three long sessions based on giving information, graded exposure without avoidance, and group support with natural coping models. Measures of self-reported anxiety levels were taken at regular intervals. The results showed that being given information or undergoing a simulated flight had little effect on perceived anxiety. Prolonged exposure to flying had a marked effect on reducing anxiety and anticipated apprehension about future flying. At one-year and three-year follow-up, 40% and 60% of participants had flown commercially, although there was some minor restoration of anticipated anxiety associated with flying; 84% showed less anxiety about flying. Psychological intervention, in collaboration with airlines, may have marked benefits in reducing fear of flying.

Many people are apprehensive about air travel. Agras *et al* (1969), in an epidemiological study of phobias, reported fear of flying to be intense in 10% of the population and mild in 20%. For some, the anxiety associated with such travel causes psychological and/or physiological symptoms severe enough to prevent the sufferer from flying. In consequence, social life, vacations or job opportunities may be impaired.

Most of the research into the treatment of phobic reaction to flying has concentrated on military personnel and trained air crew (Anderson, 1948; Morgenstern, 1966; Goorney, 1970; Aitken *et al*, 1970; O'Connor, 1970; Daly *et al*, 1970; Aitken *et al*, 1981). Anderson (1948) believed that "the prognosis is usually bad". Morgenstern (1966) concluded that there was no successful treatment for USAF personnel, although Goorney (1970) did note flying phobia to be a treatable condition. This was confirmed by Aitken *et al* (1970) when, as a result of using a combination of behavioural strategies together with psychotherapy, 9 out of 14 aircrew were able to return to limited flying duties. Each of these studies had discussed flying phobia and its treatment with specific reference to the *acquisition* of such fear in persons whose occupation involved operational flying and which subsequently led to their avoidance of flying.

Denholz *et al* (1974, 1978) described an automated audio-visual programme which combined desensitisation, modelling and positive reinforcement, so allowing 40 out of 51 (78.4%) civilian participants,

who undertook the programme, to fly. Twenty-six of those who had flown after treatment were contacted three and a half years later. Twenty-three of them had maintained their ability to fly.

Solyom *et al* (1973), in a study of treatment efficacy for 40 patients with air travel phobia, used three behaviour therapy techniques - aversion relief, systematic desensitisation, and habituation - all of which proved equally effective in significantly reducing the phobia, while group psychotherapy was ineffective. However, at follow-up, the difference between the approaches was no longer significant. The authors suggested that the behaviour therapy techniques achieved a more immediate result because they were more directly symptom-orientated. They also found that previous extensive flying experience tended to reduce the benefits of therapy.

In a study on 56 self-selected but screened civilian volunteers with a fear of flying, Howard *et al* (1983) compared results on small groups allocated to different regimes of therapy. After an eight-week programme of either systematic desensitisation, flooding, implosion, relaxation or no treatment, the subjects and therapists took a plane flight. Measures used during the flight failed to distinguish between the groups, a result which was attributed to the dilution of the comparative groups. We investigated a form of intervention on a larger number of subjects, which involved education, desensitisation and flooding.

Method

Participants

Participants were self-selected to the programme following national television and local radio coverage of a similar, apparently highly successful, course undertaken previously by two of us (JSMcC; NB) working with a local self-help group. In order to select *out* those with a simple apprehension, rather than a true fear of flying, entry requirements to the programme for evaluation were relatively strict. Each enquirer was sent information about the programme together with an enrolment form. All applicants were required to obtain in writing their doctor's certification that they were mentally and physically fit to attend the course. Forty-six people were recruited, 38 of whom completed the programme (11 males; 27 females). Their mean age was 44.3 years (s.d. 12.4 years).

Comparison group

Twelve people enquired about the programme too late to attend. They formed a comparison group (3 males; 9 females). Their mean age was 50.5 years (s.d. 10.6 years).

Programme

The principles of the intervention strategy included preparation by information, graded exposure over long sessions without avoidance, and group support with natural coping models. The course consisted of three sessions, each approximately three hours long, separated by one to two weeks.

The first session took the form of a group meeting at which talks were given by a psychologist on the physiology and behavioural control of fear; and by an experienced pilot on flight procedure and safety.

Session two was held at a nearby airport with the cooperation of its Director and British Midland Airways. It was designed to simulate all aspects of civilian flying without actually taking off. Participants were asked to check in and wait in the departure lounge until their 'flight' was called. During the waiting period help and support were given, where appropriate, by the course organisers although generally participants were encouraged to feel in control and to be personally coping. After being given an hour to become accustomed to the airport atmosphere, the group went through customary security checks and boarding procedures. On board, the passengers were seated, seat belts fastened, the aircraft doors closed, the steps removed and the engines started. Each procedure was explained carefully over the intercom by the pilot, and a simulated flight then took place. During this time standard announcements concerning altitude, weather, positional checks etc. were made. The atmosphere of realism was further reinforced by the serving of light refreshments by the cabin crew.

At the third session, smaller subgroups of between six and eight people undertook a scheduled return flight (courtesy of the airline) lasting approximately one hour each way. They were accompanied by two of the course organisers. During a 30-minute turn-around period participants remained on the aircraft. After disembarking, the

course organisers reinforced the participants' coping strategies and emphasised the positive aspects of their experience.

Evaluation techniques

On enrolment in the programme, participants gave general demographic details of themselves and indicated whether they had flown previously, what worried them about flying and if they had ever received treatment for 'nervous tension'.

A series of 10 cm visual analogue scales was constructed. These were designed to monitor the severity of anxiety each participant felt they would experience in a number of situations connected with flying. The scales were completed before the first session, two days after finishing the course and at a one-year follow-up. The comparison group completed these scales one month apart, only.

All participants completed Spielberger's State Anxiety Inventory (SSAI) (Spielberger *et al.*, 1970) during the introductory meeting and before boarding the aircraft at the second session. The SSAI was also completed on a further three occasions during the last session: one prior to boarding; one on board shortly prior to take-off and one mid-way through the return flight.

At follow-up, one year later, participants were asked whether they had flown during that period, and if so, how often. They were asked to comment on their experience and whether the programme had influenced their views about flying. At a three-year follow-up, participants were again contacted in order to identify a total number who had subsequently flown.

Results

Ill health, business pressures or the intervention of holidays prevented five people from completing the programme, three of whom did subsequently fly. A further three participants were too fearful to attempt the final session. This left a total of 38 people who completed all three sessions.

What worried people about flying?

Fourteen (37%) of the participants were worried about 'being enclosed'. That was the most common fear expressed. Thirteen people (34%) were afraid of crashing. Five people (13%) were frightened of heights. The remainder were fearful either of loss of control or airsickness, or had multiple worries.

Anxiety profile across the programme

The median self-rated state anxiety scores are shown in Fig. 1. Analysis by the Wilcoxon matched-pairs test shows that there was no statistically significant difference between the scores obtained in the introductory session and those given before the simulated flight. Compared with initial levels, anxiety scores rose significantly before the actual flight ($P < 0.001$) and, although falling significantly after take-off ($P < 0.001$), remained higher during the outward flight ($P < 0.01$) than at the initial meeting. On the return flight, however, anxiety levels fell markedly and were significantly less than they had been at the first meeting ($P < 0.002$).

The Mann-Whitney *U* test identified less anxiety in the claustrophobic group in comparison with the group fearful

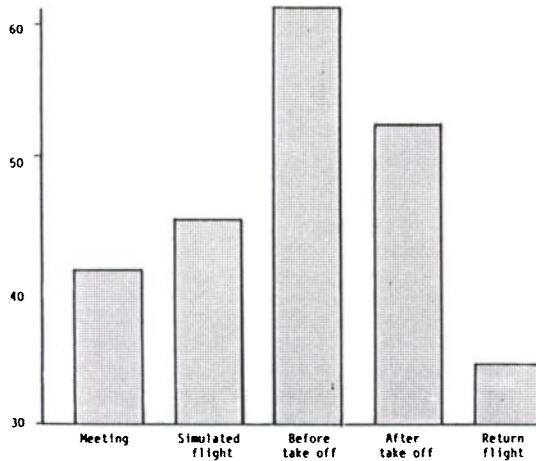


FIG. 1 Median Spielberger Anxiety Scores measured at points throughout the course.

of heights both after take-off ($P < 0.05$) and on the return flight ($P < 0.05$). The claustrophobic group, too, in comparison with those fearful of crashing, was less anxious after take-off ($P < 0.05$) and on the return flight ($P = 0.05$).

Scores on the visual analogue scales, completed two days after the programme, were compared with those obtained before the first meeting. After completing the course, participants felt less anxious about looking at photographs of aircraft ($P < 0.04$), meeting people at an airport ($P < 0.002$), watching a film of an aircraft taking off ($P < 0.04$), waiting to board an aircraft ($P < 0.001$), sitting in an aircraft ($P < 0.001$), taking off ($P < 0.001$), and flying over land ($P < 0.001$) or water ($P < 0.001$). They also rated aircraft as being less often in the news ($P < 0.001$).

Comparisons were made of the analogue scores given by

the untreated comparison group and those given by the course participants. The Mann-Whitney U test showed that the two groups did not differ initially on any scale, except one. The comparison group rated aircraft to be less often in the news than did the experimental group ($P < 0.02$). After intervention and compared with the comparison group, the experimental group thought they would feel calmer when waiting in the departure lounge ($P < 0.001$), boarding an aircraft ($P < 0.001$), sitting in an aircraft ($P < 0.001$), taking off ($P < 0.001$), and flying over land ($P < 0.001$) or water ($P < 0.001$) (Fig. 2).

The mean anxiety scores of those who enrolled on the course but who were unable to complete it either because they were too fearful or because of ill-health, business or social reasons are shown in Table I. Small numbers preclude formal statistical analysis but it does appear that there is no marked difference in anxiety scores between those too fearful to undertake the final session, and those who either did undertake it, or for other reasons were unable to do so.

One-year follow-up

Thirty-six (95%) of the participants returned the follow-up questionnaire and analogue scales sent to them one year later. Compared with their preliminary completion of the scales, all subjects were significantly less anxious about all the aspects of flying covered by the questions. However, when compared with the scales completed immediately after the course, there was a significant rise in perceived anxiety associated with sitting in an aircraft ($P = 0.001$), flying over land ($P = 0.004$), and flying over water ($P = 0.005$) (Fig. 3).

Two people did not return the questionnaires. One of them had previously communicated that she had undertaken a flight. Thus fifteen (39%) of the group had flown in the intervening year. Of the remainder, eleven people said they had not had the opportunity to fly; eight others had definite plans to do so and three more were too anxious to consider flying. One only was lost to follow-up. Thirty-two (84%)

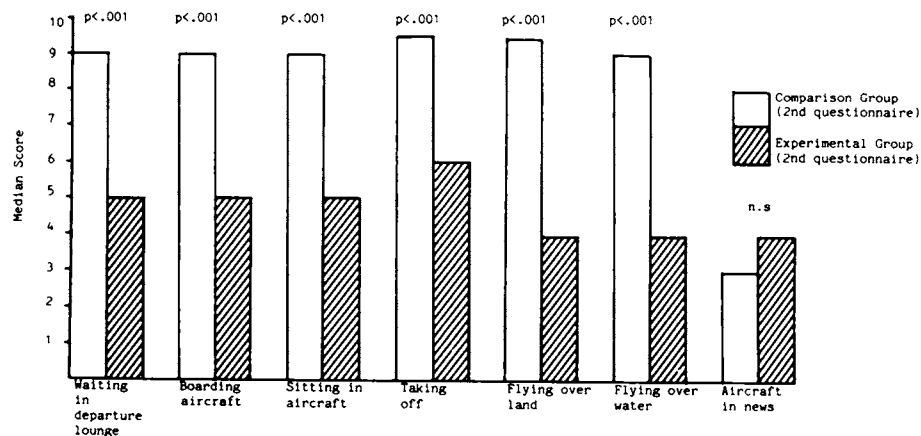


FIG. 2 Median score for fear of flying, visual analogue scale (after intervention): comparison group v. experimental group

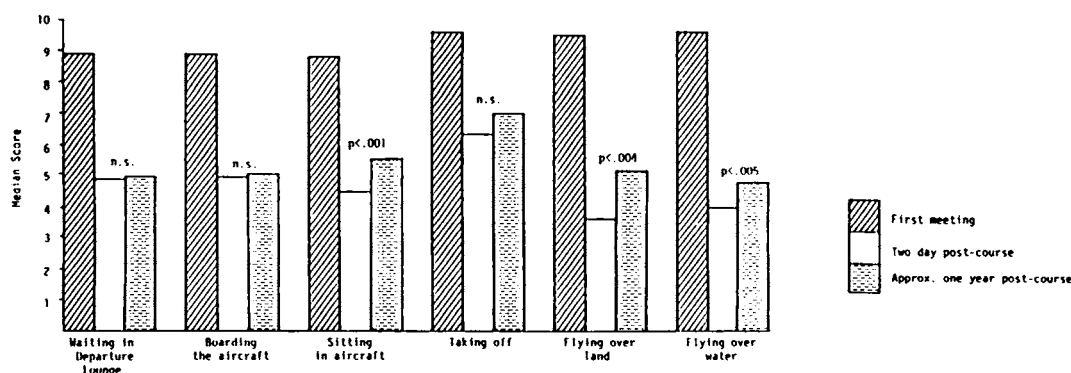


FIG. 3 Median score for fear of flying, visual analogue scale: the *P* values show the differences between the two-day post-course and the one-year post-course measurements

TABLE I
Mean SSAI scores for participants

	First meeting			Simulated flight		
	Mean	s.d.	n	Mean	s.d.	n
Subjects too fearful to complete the course	36.66	10.115	3	51.66	21.571	3
Subjects not completing the course for other reasons	45.00	13.416	5	46.75	0.957	4
Experimental subjects	43.44	14.157	36	46.37	12.661	37

of the participants reported themselves to be less anxious about flying.

The only variables to discriminate between those who had flown during the year and those who had not were those linked to changes in anxiety during the course. Participants who had flown after the course were those who had shown greatest reduction from the first session to the post-course evaluation in their rated anxiety while in the departure lounge ($P=0.01$), boarding an aircraft ($P=0.004$) and sitting in an aircraft ($P<0.005$).

Three-year follow-up

Three years after the course, a total of 23 participants reported that they had flown (61%), ten had not flown (26%), and from five there was no reply to a questionnaire (13%).

Discussion

The aim of the course was simply stated as one of offering applicants the necessary degree of help and encouragement needed to enable them to travel by air. Since over 60% of the participants subsequently

flew, it seemed that a fair degree of success could be claimed. However, since the subjects were self-selected, it is possible that they did not represent the most extreme cases of aerophobia. Nevertheless, two factors suggest that they did represent a group of people who were particularly fearful of flying. Firstly, nearly half the group had never flown before; and of those who had, the majority had not flown for many years. Secondly, there was the commitment needed to fulfil the requirements of the course. Participants had to obtain permission from their general practitioner and provide a certificate of fitness. Many had to travel substantial distances in winter weather conditions to attend the three long and stressful sessions. In short, they were a particular group but we thought them to be fairly typical of people with a moderate to severe fear of flying.

If subjective ratings are considered, the course also appears to have been successful. Although the confidence that was evident immediately after the course-flight had diminished slightly at the one-year follow-up, subjects did rate themselves as significantly less anxious about flying than they had been prior to the course. Of those who completed it, 84% claimed to be subsequently less anxious about flying. It was the apparent success of the course which made it difficult to assess which people had benefited most from it. It had been assumed that its educational element, together with the reassuring presence of an experienced pilot, would particularly benefit the inexperienced passenger and those who were anxious about crashing. This hypothesis was not, however, borne out by our findings. Similarly the claustrophobic group, who we feared would find the experience particularly stressful, was significantly less anxious during the flight than the rest of the group.

A secondary aim of the study was to attempt to identify those people who would benefit most from this form of treatment. In view of previous findings by Gelder *et al* (1973) that different types of phobias do not respond differently to flooding with the feared stimulus, it was perhaps not surprising that we failed to identify those who would do particularly well as a result of our intervention. The claustrophobic group was significantly less anxious than other groups during the course-flight but that was not reflected in their willingness to fly after the course.

Those who did subsequently fly were noted to have shown the greatest reduction from the first session to the post-course evaluation in their anxiety levels while in the departure lounge, boarding an aircraft and sitting in one.

From our results, it would seem unlikely that the personal characteristics of the phobic subject were important in determining the success of the treatment programme. The results, however, do seem to show that this form of group treatment, in civilian aerophobics, can be effective. Furthermore, in contrast to previous studies, which have involved numerous sessions, required specialised equipment and the time of psychologists skilled in behavioural therapy, our strategies were relatively economical (Solyom *et al*, 1973; Denholz & Mann, 1974; Denholz *et al*, 1978). Since we showed little evidence for an anxiolytic effect of giving phobics information about flying, it may be that more emphasis on exposure to the airport environment and aircraft and less emphasis on educational aspects might improve the therapeutic response and reduce the number of sessions needed.

Gelder *et al* (1973) have reported that prolonged exposure to the feared stimulus is as effective as systematic desensitisation in relieving phobias. Continuous exposure to the feared situation also seems more effective than continued brief ones (Stern & Marks, 1973), the latter of which may paradoxically increase fear (Stone & Borkovec, 1975). Our participants remained on the aircraft during the turn-around period in the third session, and that continuous exposure may have contributed to the marked fall in anxiety levels observed during the return flight.

Exposing phobics *in vivo* to the feared situation needs careful regulation: there are ethical problems in indiscriminately encouraging phobics, especially

those with previous traumatic experiences of flying, to attempt air travel without appropriate psychological support. Nevertheless, with air travel becoming an increasingly routine activity, it does appear possible that airlines, co-operating with psychologists, could attempt some of the principles used in the present study in order to help some of their more fearful potential passengers to fly.

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Cristine P. Walder, BA, SRN, *Research Assistant, Department of Psychiatry*; *Jim S. McCracken, MB, ChB, FRCGP, DCH, DOBstRCOG, *formerly Lecturer, Department of Community Health, now Lecturer, Department of General Practice*; Michael Herbert, BA, PhD, *Senior Lecturer, Department of Psychiatry, The University, Nottingham*; Peter T. James, BSc, MPhil, *formerly Senior Clinical Psychologist, St Ann's Hospital, Nottingham, now Principal Clinical Psychologist, The Royal Victoria Infirmary, Newcastle upon Tyne*; Norman Brewitt, *formerly Flight Manager, European Operations, British Midland Airways, now Director of Operations, Manx Airline, Isle of Man*

*Correspondence: *The University of Nottingham, Queen's Medical Centre, Clifton Boulevard, Nottingham NG7 2UH*