

# Fear of Flying: Impact on the U.S. Air Travel Industry

ROBERT D. DEAN AND KERRY M. WHITAKER

*One of every six adult Americans—25,000,000—is afraid to fly. These people make two-thirds fewer trips on commercial aircraft than those who are not afraid. The 1978 impact on the U.S. air travel industry is estimated to be a \$1.6 billion revenue loss and a 9% reduction in air travel. These are the conclusions drawn from five surveys conducted between 1976 and 1979 to measure how fear of flying affects the air travel industry.*

An airline pilot with 19 years experience occupationally disabled by fear of flying . . . a 60-year-old aeronautical engineer unable to visit the European country of his birth . . . a lawyer whose firm was floundering because he could not visit clients across the country . . . a secretary unable to vacation in the tropics . . . a housewife unable to accompany her husband on business trips . . .

Fear of flying is a ubiquitous phenomenon. It has been observed to occur in almost identical frequencies in New Orleans (Fear of Flying—Who's Got It, 1976) and Burlington, Vermont (Agras, Sylvester, and Oliveau 1969). It has been the subject of many TV talk shows and magazine articles, in which a recurring theme has been that there are between 20 and 25 million Americans who are afraid of flying (Afraid of Flying, 1975; Fear of Flying and What to Do About It, 1976; Werner 1977; Taking the Fear out of Flying 1977; Baxter 1979; and English 1977). An extensive professional literature covers all aspects from psychoanalytic interpretations of the fear causes to experimental investigations of therapy effectiveness (Bond 1952; Morgenstern 1966; Scignar, Swanson, Bloom 1973; and Shaw 1977).

The air travel industry has long been concerned about fear of flying, as illustrated by its support of programs designed to alleviate fear of flying and, to a limited extent, by fostering empirical evaluations of program effectiveness. During the past four years, Pan American World Airways has sponsored specialized training of more than 2,000 persons in how to cope with fear of flying. (It was during the Pan Am program in Seattle that the individuals described at the beginning of this report were observed.) Another 4,700 persons have received training in seven different privately sponsored programs, all of which have been supported to some degree by the air travel industry.

There has, however, never been a systematic investigation of fear of flying on a national scale. The estimate of 20 to 25 million Americans who are afraid of flying that ap-

pears so often in the popular literature, for example, is apparently based on an extrapolation of the 1969 adult American population from a 20% fear-of-flying rate observed in a survey of 325 persons in Burlington, Vermont (Agras, Sylvester, and Oliveau 1969). A similar fear of flying rate (21%) observed in New Orleans in 1976 was based on a survey of 214 persons in restaurants and shopping centers (Fear of Flying—Who's Got It, 1976). While the consistency of the Burlington and New Orleans studies is extremely suggestive, neither represents the type of samples from which reliable national estimates can be made.

Nor is it known to what extent fear of flying is a function of the characteristics of the individual. In both the Burlington and New Orleans studies, it was found that fear of flying was twice as prevalent among women as among men (11% vs 27% in Burlington and 14% vs 28% in New Orleans). A second part of the New Orleans study that involved 281 travelers at the New Orleans International Airport revealed that there may be a nontrivial segment of persons among air travelers who are afraid of flying (7% of the men and 20% of the women). Apart from these limited data, the influence on fear of flying of such variables as age, race, education, occupation, and income is essentially unknown.

For both society and the air travel industry, there are two core questions. The first is whether fear of flying is a real problem in terms of its effect on air travel behavior; the second, what should be done about it.

It is one thing to be uncomfortable when traveling on a commercial aircraft, or even to suffer acute anxiety; it is quite another to be unable to make necessary business and personal trips because of that anxiety. The folklore on fear of flying is replete with examples of persons who have become occupationally disabled by fear of flying. That such people exist cannot be denied. But are they the exception or the rule? Do people who are afraid of flying avoid traveling on commercial aircraft? Do they make, on the average, fewer trips than those who are not afraid? What is the aggregate effect on total industry revenue? These questions have never been addressed.

There is a host of relevant issues concerning what should be done about fear of flying if it should prove to be a significant problem in terms of its effect on air travel behavior.

Robert D. Dean, Industrial Psychologist, and Kerry M. Whitaker, Statistician, are consultants with the Boeing Computer Service. The work reported here was conducted under the sponsorship of Kit Narodick, Director Analysis and Support, Boeing Commercial Airplane Company.

What causes fear of flying? How do the levels of anxiety during air travel compare with those in other methods of transportation and flight-related situations (heights, confined spaces)? How significant is fear of flying in comparison with other sources of flight avoidance (costs, difficulties of airport access)? How effective are the current methods of treatment, and how many people would be expected to participate in such treatment? Are there actions the air travel industry could take directly in terms of personnel training and design of equipment and facilities? What special consideration, if any, is required to accommodate the growing segment of the domestic air travel market made up of persons from foreign countries?

The research literature is extremely thin with regard to these concerns. In the Burlington study, for example, it was observed that fear of flying was much less common than fear of heights (20% vs 31%), but more common than fear of confined spaces (12%). A review of the literature (Carr 1977) on treatment effectiveness revealed that 77% of the persons receiving behavioral therapy and 50% of those receiving group psychotherapy were able to successfully travel on commercial aircraft after treatment had been completed. These data, however, are based on only three studies and a total of 66 subjects.

#### RESEARCH OBJECTIVES

This investigation was primarily concerned with determining whether fear of flying is a significant problem for the air travel industry. To accomplish this, a series of national and special-purpose surveys was conducted to answer these questions:

- What is the prevalence of fear of flying among the adult American population?
- What is the relationship between fear of flying and age, sex, and socioeconomic position?
- What is the effect of fear of flying on air travel behavior?

- What is the overall effect of fear of flying on the domestic air travel industry in terms of reduced air travel and lost revenue?

Ancillary issues pertaining to what should be done about fear of flying (e.g., flying avoidance, other sources of anxiety) were dealt with to the extent permitted by the methodology used. No attempt was made to deal directly with treatment effectiveness or with populations outside the United States.

#### RESEARCH METHOD

Five surveys, involving 5,860 respondents, were conducted. These consisted of two national surveys, one survey of business travelers, and two surveys of persons attending the "fearful flyer" programs sponsored by Pan American World Airways. The survey characteristics are summarized in Figure 1.

Data for the two national surveys were collected by independent research organizations working under contract to the Boeing Commercial Airplane Company. Of these, the survey by International Research Associates (INRA) was designed to serve as a pilot study. It consisted of a limited set of questions dealing with fear of flying along with demographic information. The national survey by the Opinion Research Corporation (ORC) was designed to validate the INRA study, and to collect more detailed data on frequency of air travel, travel anxiety (buses, trains), and situational anxiety (heights, confined spaces). The data for the survey of business travelers were collected by Boeing Computer Services (BCS) and concerned the same issues as the ORC study, as well as a much more detailed treatment of the sources of flying anxiety (takeoff, landing). Of the two surveys of fearful flyers, one, the BCS/Pan Am survey, used the same questionnaire as the BCS business traveler survey. The other, the Pan Am survey, used a questionnaire designed by Pan Am to assist the program instructor and primarily concerned the causes and symptoms of fear of flying.

FIGURE 1  
SURVEY CHARACTERISTICS

	INRA Survey	ORC Survey	BCS Survey	BCS/Pan Am Survey	Pan Am Survey
Data collection organization	International Research Associates (G. H. Hodel, M.D.)	Opinion Research Corporation (W. S. Conway)	Boeing Computer Services (R. D. Dean, Ph.D.)	Pan American World Airways (Capt. T. W. Cummings)	Pan American World Airways (Capt. T. W. Cummings)
Survey date	Spring 1978	Fall 1978	Spring 1978	Summer 1978 to Spring 1979	Spring 1976 to Fall 1977
Survey type	In-person interview	In-person interview	Mailing	In-person handout	In-person handout
Population of concern	U.S. population	U.S. population	Business travelers	Fearful flyers	Fearful flyers
Key questions	Fear of flying Demographics	Fear of flying Travel behavior Travel anxiety Situational anxiety Demographics	Fear of flying Travel behavior Travel anxiety Situational anxiety Flight component anxiety Demographics	Same as BCS survey	Travel behavior Causes of flight anxiety Symptoms of flight anxiety Demographics
Sample size	2,002	2,117	1,008	245	488
Response rate (%)	99	99	84	99	99

The INRA and ORC national surveys were of the in-person doorbelling type; sample sizes were 2,002 and 2,117 respectively. The samples were drawn to be representative of the continental U.S. adult (over 18) population, exclusive of institutions (prisons, nursing homes, military bases, etc.). The primary sample control techniques were geographic location and time of interview. Secondary control techniques were the demographic characteristics of the sample (age, sex, etc.) as compared with census estimates. Response rates with followup approached 100%.

The BCS business traveler survey involved a mailing to a complete sample of all programmer-analysts employed by BCS in offices throughout the country. A total of 1,008 questionnaires was returned, giving an overall response rate of 84%.

In the BCS/Pan Am and Pan Am surveys, the questionnaires were distributed by the instructor at the beginning of the program. The BCS/Pan Am survey respondents were 245 persons taking the fearful flyer program in New York, Philadelphia, and Miami between the summer of 1978 and spring of 1979.

In the Pan Am survey, there were 488 responses from persons taking the program in 10 cities between the spring of 1976 and the fall of 1977. Response rates for the fearful flyer surveys approached 100%.

The primary measurement tool was a four-page questionnaire that consisted of the following type of questions:

- Open-ended questions: "How many business trips did you make on commercial aircraft during the past 12 months?"
- Checkoff questions: "Are you afraid of flying?"
- Scaling questions: Experienced or anticipated anxiety levels in different situations (e.g., commercial air travel) were rated on a 100-point scale in which "0" represented no anxiety and "100" represented terror.

The questionnaire contained sections on personal characteristics (age, sex, education), frequency of commercial air travel, and anxiety during different modes of travel, flight-related situations, specific flight events, and anticipation of commercial air travel. This questionnaire was used unabridged in the BCS programmer-analyst and the BCS/Pan Am fearful flyer surveys. In the ORC national survey, the section on anxiety during specific flight events was eliminated, and the wording of the questions was modified to accommodate the in-person interview technique. In addition, two open-ended questions pertaining to the causes of flying anxiety and flying avoidance were added. The INRA national survey dealt only with a limited set of questions about whether an individual was afraid to fly and the collection of data on personal characteristics. The questionnaire in the Pan Am fearful flyer survey had little in common with the primary instrument, consisting largely of open-ended questions on the causes and symptoms of fear of flying.

The core concepts in this investigation were fear, anxiety, and anxiety rating, all of which can have a multiplicity of meanings in both the popular and professional literature. For the purposes of this investigation, fear was operationally defined in terms of an individual who answers affirmatively to the question, "Are you afraid of flying?" Anxiety was defined in terms of an individual who answers negatively to the question about fear and affirmatively to, "Do you experience any anxiety while flying?" Anxiety rating was defined in terms of the 100-point scale described earlier. Given

these operational definitions, the research question then became that of determining how they are related to such phenomena as frequency of air travel, demographic characteristics, and conditions of flight. In the interpretation of the data, care was taken by the authors to avoid ascribing meaning to the core concepts beyond their immediate operational definitions.

Data analysis and interpretation were entirely the responsibility of the authors of this report. The 0.01 level was used in assigning statistical significance (i.e., it was concluded that a test statistic for a given hypothesis was significant whenever the probability of chance occurrence was less than 1 in 100). In doing so, it was recognized that whenever a large number of tests of statistical significance is computed, some will be statistically significant by chance alone; the probability of this occurring increases dramatically as the number of tests increases. For this reason, primary reliance was placed on observations that were supported by independent investigations or by consistent patterns within the data.

## RESULTS

### Prevalence of Fear of Flying

In the INRA and ORC national surveys, 15.6% and 18.1%, respectively, of the persons surveyed answered affirmatively to the question, "Are you afraid of flying?" Merging the data yielded a combined best estimate of 16.9% (99% confidence interval of 15.4 to 18.4%). Using the U.S. Census Bureau's 1976 continental U.S. estimate of 148,626,000 Americans over 18 as a base, these percentages extrapolate to an estimated 25.1 million adult Americans who are afraid of flying (99% confidence interval of 22.9 to 27.3 million).

The data from the ORC national survey on fear of flying as a function of air travel experience are shown in Table 1. It can be seen that fear of flying is most prevalent among those who have never flown and who describe themselves as "not likely to fly" (54.2%). Among persons who have flown on commercial aircraft, 10.2% are afraid of flying. Anxiety about flying appears to be functionally opposite to fear, in that it is more prevalent among flyers than nonflyers and that it is least prevalent among nonflyers who are not likely to fly. Comparison between persons who had flown on a commercial aircraft, but not during the previous three years, and those who had flown during the previous three years, revealed no differences in the prevalence of fear of flying.

The most critical demographic variables with respect to fear of flying were found to be sex, race, and socioeconomic position. Fear of flying was twice as prevalent among women as men (21% vs 9% in the INRA study and 26% vs 11% in the ORC study). Blacks had a higher rate of fear of flying than whites (22% vs 15% in the INRA study and 30% vs 17% in the ORC study). The data on other races (Asians, Hispanics, and Native Americans), because of the representative nature of the samples, were insufficient to permit reliable estimates. With regard to socioeconomic position, both the INRA and ORC surveys yielded statistically significant relationships for household income, education, and occupational status, all of the form that the highest rates of fear of flying occurred among those of lower socioeconomic position. Figure 2 shows the data from the ORC survey on the

**TABLE 1**  
**PREVALENCE OF FEAR OF FLYING AS A FUNCTION OF FLIGHT EXPERIENCE ON COMMERCIAL AIRCRAFT**

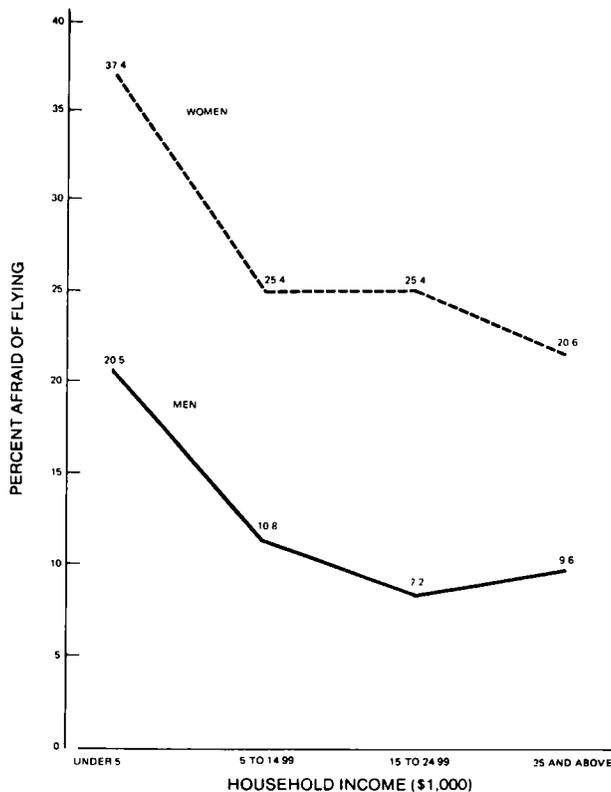
Anxiety With Respect to Flying	General Population (%)	Flyers (%) <sup>a</sup>	Nonflyers (%) <sup>b</sup>	Nonflyers <sup>b</sup> Likely to Fly (%)	Nonflyers <sup>b</sup> Not Likely to Fly (%)
No anxiety	69.4%	76.0%	53.5%	57.9%	43.5%
Anxious	12.6	13.8	9.7	20.8	2.3
Afraid	18.1	10.2	36.8	21.3	54.2
Sample size	1,948	1,372	576	221	260

<sup>a</sup>"Flyers" refers to persons over 18 who have flown on a commercial aircraft at least once.

<sup>b</sup>"Nonflyers" refers to persons over 18 who have never flown on a commercial aircraft.

relationship between household income, sex of the respondent, and fear of flying. Neither age nor marital status were found to be related to fear of flying in a statistically significant manner.

**FIGURE 2**  
**RELATIONSHIP BETWEEN HOUSEHOLD INCOME, SEX, AND FEAR OF FLYING**



#### Frequency of Commercial Air Travel

Although the frequency of air travel lies outside the primary area of interest in this investigation, it was necessary that it be taken into consideration to obtain a baseline for determining the effect of fear of flying. The ORC national survey provided the necessary data; in addition, corroborative

data were available from a series of Gallup surveys that have been conducted periodically since 1962 (The Frequency of Flying Among the General Public 1979). The ORC survey indicated that 69% (Gallup: 65%) of the adult population has flown on a commercial aircraft and that 34% (Gallup: 27%) have flown during the previous 12 months; 46% have flown during the previous three years. Business trips accounted for 49% (Gallup: 55%) of all trips, and personal trips accounted for 51% (Gallup: 45%). Although the number of business and personal trips was approximately equal, the number of people making business trips was one-third those making personal trips (10% vs 30%). Commensurate with this, business travelers made on the average three times as many trips as personal travelers (9.3 vs 3.2 one-way trips per year).

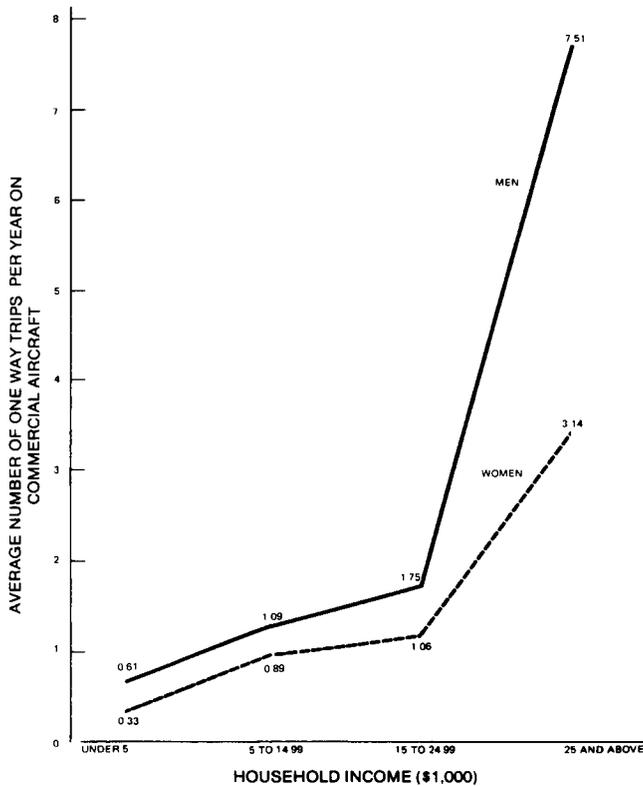
The most critical demographic variables were sex, race, socioeconomic position, and marital status. Women made one-fifth as many business trips as men (0.3 vs 1.5 one-way trips per year); the difference in personal trips was not statistically significant at the 0.01 level. Blacks made one-half as many trips as whites (0.8 vs 2.0). Single and divorced persons made more personal trips. The higher the socioeconomic position, the higher the frequency of air travel as measured in terms of household income, education, and occupational status. Except for persons over 75, air travel did not vary significantly as a function of age.

Figure 3 shows the relationship between household income, sex, and commercial air travel. Although the average number of trips is lower for women at all income levels, the difference between the sexes is statistically significant only for households having incomes of \$25,000 or above. Moreover, this difference is entirely attributable to business travel; at no income level is the difference in personal travel between the sexes statistically significant.

#### Relationship Between Fear of Flying and Air Travel

The data from the ORC national survey on the overall relationship between fear of flying and frequency of commercial air travel are presented in Table 2. On the average, people who are afraid of flying make less than one-third as many trips on commercial aircraft as those who have no fear. They make one-third as many personal trips and one-fifth as many business trips. There is, however, no evidence to suggest that people who are anxious about flying, but not

**FIGURE 3**  
RELATIONSHIP BETWEEN HOUSEHOLD INCOME, SEX, AND FREQUENCY OF AIR TRAVEL



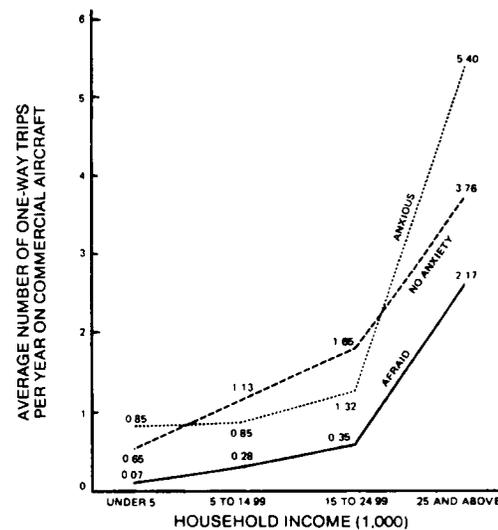
afraid, make fewer trips than those who are neither anxious nor afraid.

Although the data on average number of trips suggest that fear of flying has a greater effect on business than on personal travel, the eta-squared statistics shown in Table 2 indicate the opposite. It appears, therefore, that the effect

of fear of flying on business travel is less consistent than on personal travel.

Figure 4 shows the relationship of household income, fear of flying, and air travel. At every income level, the frequency of air travel is lowest among those who are afraid of flying. The differences are statistically significant at the 0.01 level for the three lower income levels, but not for those above \$25,000, even though the overall differences in average number of trips are comparable. As before, there is little to suggest that persons who describe themselves as being anxious about, but not afraid of, flying make fewer trips than those who describe themselves as being neither anxious nor afraid. The sample sizes were not sufficient to permit partitioning the data on the basis of both sex and household income.

**FIGURE 4**  
RELATIONSHIP BETWEEN FEAR OF FLYING, HOUSEHOLD INCOME, AND FREQUENCY OF COMMERCIAL AIR TRAVEL



**TABLE 2**  
AVERAGE NUMBER OF TRIPS ON COMMERCIAL AIRCRAFT AS A FUNCTION OF FLYING ANXIETY<sup>a</sup>

Type of Trip	Anxiety With Respect to Flying			Statistical Significance <sup>b</sup>	Eta-Squared <sup>c</sup>
	No Anxiety	Anxious	Afraid		
Previous 12 months					
Business	1.1 (1,337)	0.9 (245)	0.2 (349)	0.0087	0.0035
Personal	1.1 (1,340)	1.3 (243)	0.4 (351)	0.0000	0.0177
Total	2.1 (1,333)	2.1 (243)	0.6 (349)	0.0000	0.0085
Previous 36 months					
Business	2.5 (1,331)	2.5 (245)	0.4 (350)	0.0008	0.0059
Personal	2.7 (1,338)	3.5 (245)	0.9 (351)	0.0000	0.0174
Total	5.1 (1,325)	5.9 (245)	1.3 (350)	0.0000	0.0140

<sup>a</sup>Numbers in parentheses ( ) indicate sample size.

<sup>b</sup>"Statistical significance," based on the chi-square statistic, indicates the probability that the differences could have occurred by chance; the lower the value, the greater the significance.

<sup>c</sup>"Eta-squared" indicates the proportion of variance in air travel accounted for by flying anxiety; the larger the value, the greater the influence of fear of flying.

## Extrapolation Accuracy

In surveys of this type, it is common practice to partially assess the accuracy of extrapolations from the survey by comparing them to independent published data, even though such comparisons may lie outside the immediate area of interest. In this case, the data from the ORC national survey were used to estimate the total number of one-way trips on commercial aircraft in the U.S. in 1978. Comparison of this estimate with the most comparable data from the Civil Aeronautics Board (CAB), which were for 1977, yielded a 13% discrepancy (271,139,895 estimated one-way trips from the ORC study vs. 240,326,000 enplaned passengers from the CAB) (1977). Given the different timeframes, it would appear that extrapolations from the ORC survey may possess comparable accuracy to that of published data from the CAB.

## Estimated Impact on the Air Travel Industry

Table 3 shows the estimated 1978 impact of fear of flying on the U.S. air travel industry in terms of potential gain in one-way trips, if those who are afraid of flying were to travel on commercial aircraft at the same frequency as those who have no fear. The effect of household income is controlled; sample sizes were not sufficient to permit controlling for both household income and sex.

Fear of flying is estimated to have cost the domestic air travel industry 21.3 million one-way trips, a loss of 6 million business trips and 15.2 million personal trips. The primary source of the loss appears to be among personal travelers in the \$5,000 to \$25,000 income range. Assuming an average one-way fare of \$75, the 21.3 million trips extrapolate to an estimated annual revenue loss of \$1.6 billion.

For estimation purposes, it was assumed that fear of flying had no effect on air travel among those in households with incomes above \$25,000. This assumption was made because the differences were not statistically significant for this income range. In spite of the lack of statistical significance, however, the issue should remain open because the differences were comparable in magnitude to the other income groups (where the differences were statistically signifi-

cant) and because of the limited sample size of upper-income persons inherent in the representative sampling technique used. If future research focusing on the upper-income sub-population were to reveal a fear-of-flying effect, it would greatly increase the estimated loss from fear of flying and would tend to swing the emphasis from the mid-income personal traveler to the upper-income business traveler.

## Reasons for Fear of Flying

In the ORC survey of the general population, the people who indicated they were afraid of flying were asked: "Why are you anxious or afraid of flying?" Of 562 responses, 29% were "afraid of dying" and 24% were "afraid of heights." The third most frequent reason, "afraid of bad weather," constituted 7% of all reasons given.

All of the participants in the ORC survey were asked to rate their anxiety in different situations using a 100-point scale in which 0 indicated no anxiety and 100 indicated terror. Anxiety when exposed to heights had the highest correlation with anxiety during commercial air travel of all the situations investigated (eta-squared of 0.13 for heights, 0.07 for confined spaces, 0.06 for water, and 0.05 for darkness and crowds).

In the BCS/Pan Am survey of fearful flyers, the respondents (95% of whom indicated they were afraid of flying) were queried about five flight-related situations: 59% were afraid of heights; 41% of confined spaces; 18% of water; 16% of darkness; and 12% of crowds.

Figure 5 shows data from the BCS programmer-analyst survey on the levels of anxiety experienced during the major components of air travel (takeoff, landing, etc.), and Figure 6 shows the anxiety experienced during specific flight-related events (missing luggage, bad weather, etc.). Both Figures 5 and 6 are based on the 100-point anxiety scale. For those who are afraid of flying, the highest levels of anxiety appear to occur during segments of air travel that involve heights and life-threatening situations. For those who have no fear or anxiety about flying, on the other hand, missing luggage and missed connections are as significant as

TABLE 3  
ESTIMATED IMPACT OF FEAR OF FLYING

Household Income (\$1,000)	No. Afraid of Flying <sup>a</sup> (in Millions)	No. Airline Trips Actually Taken <sup>b</sup> (in Millions)			Potential No. of Trips <sup>c</sup> (in Millions)			Potential Gain <sup>d</sup> (in Millions)		
		Business	Personal	Total	Business	Personal	Total <sup>e</sup>	Business	Personal	Total
Less than 5	4.8	0.0	0.3	0.3	0.1	3.0	3.2	0.1	2.7	2.8
5 to 14.99	10.8	0.4	2.7	3.1	2.1	9.7	11.8	1.7	7.0	8.7
15 to 24.99	7.9	0.4	2.4	2.8	4.6	7.9	12.5	4.2	5.5	9.7
Over 25	3.6	3.8	4.1	7.9	3.8	4.1	7.9	0.0	0.0	0.0
Total	27.1	4.6	9.5	14.0	10.6	24.7	35.3	6.0	15.2	21.3

<sup>a</sup>Based on the 1976 Census Bureau estimate of 148,626,000 in the Continental U.S.

<sup>b</sup>Refers to the estimated number of one-way trips made by persons who are afraid of flying.

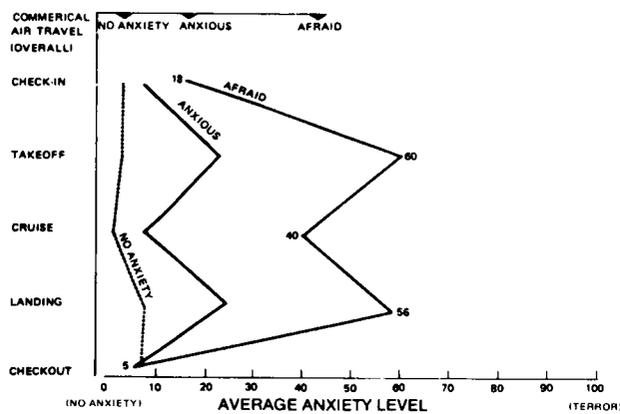
<sup>c</sup>Refers to the number of one-way trips that would be made by persons who are afraid of flying, if they were to travel on commercial aircraft at the same frequency as those in their household income level who are not afraid of flying.

<sup>d</sup>Refers to the difference between b and c.

<sup>e</sup>Discrepancies in totals are due to rounding.

sources of anxiety as the in-flight events. Comparison between the experienced anxiety shown in Figures 5 and 6, and the anxiety occurring before flight in anticipation of the same aspects of commercial air travel (also measured with the 100-point scale) indicated that anticipatory anxiety is functionally identical, although somewhat lower than experienced anxiety for both programmer-analysts (correlation coefficient equals 0.72) and fearful flyers (correlation coefficient equals 0.57). The overall anticipatory vs. experienced anxiety ratings were 31 vs. 47 for programmer-analysts and 66 vs. 71 for fearful flyers.

**FIGURE 5**  
**AVERAGE ANXIETY LEVELS DURING THE MAJOR COMPONENTS OF COMMERCIAL AIR TRAVEL**



### Comparison with Other Sources of Anxiety

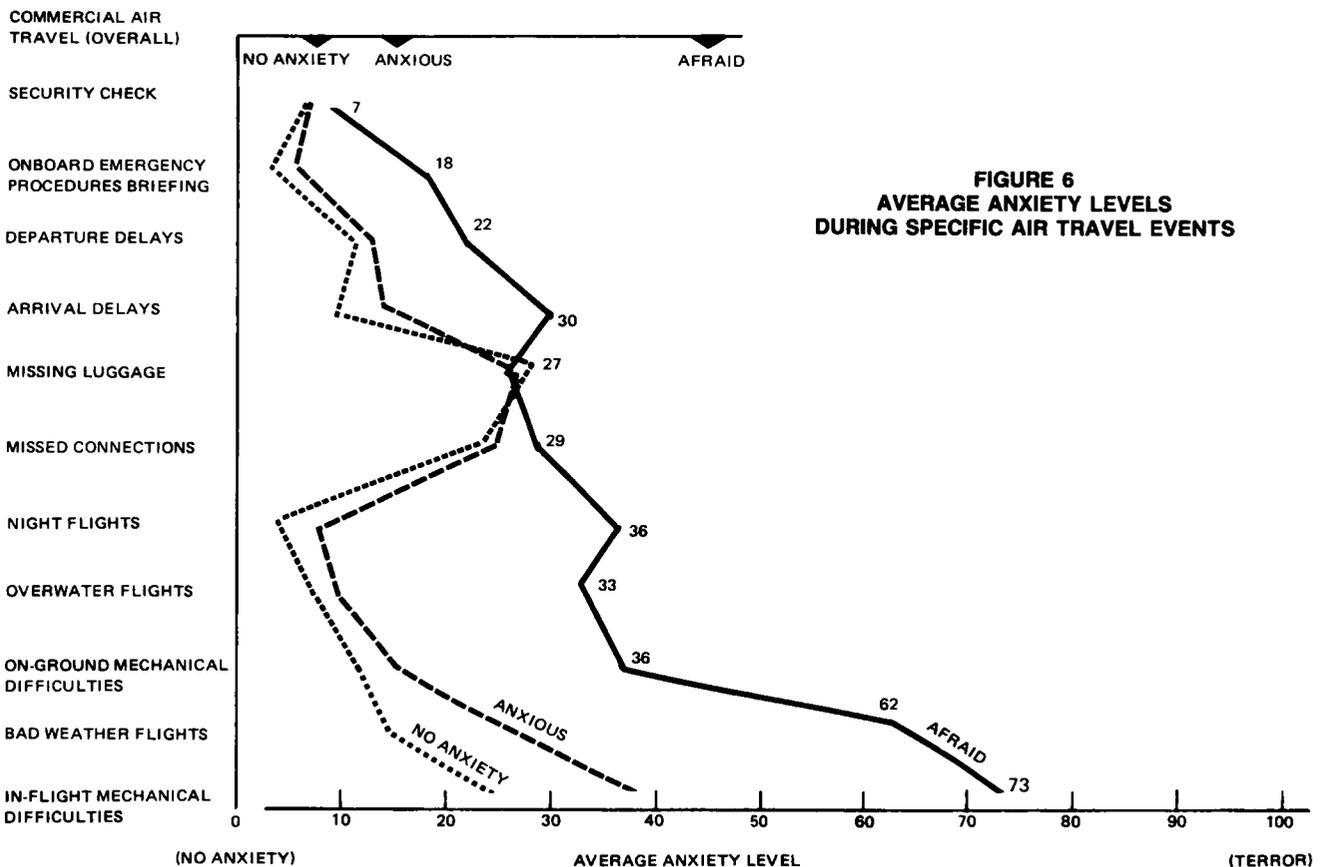
Figure 7 presents the data from the ORC survey of the general population, comparing the levels of anxiety experienced during commercial air travel with those experienced in five flight-related fear situations. Whereas less than 1% who have flown on commercial aircraft was terrorized, 8% of the general population is terrorized by heights and 7% by water. The proportion of the population experiencing high anxiety levels (i.e., anxiety rating greater than 40) is smaller for commercial air travel than for any of the five fear situations investigated.

Figure 8 presents the ORC survey data on the levels of anxiety experienced during different methods of travel. The highest levels of anxiety are reported by those who have traveled by ship—6% of whom were terrorized. Overall, the anxiety associated with commercial air travel appears to be comparable to that associated with travel by auto and higher than that associated with travel by bus or train.

### Avoidance of Commercial Air Travel

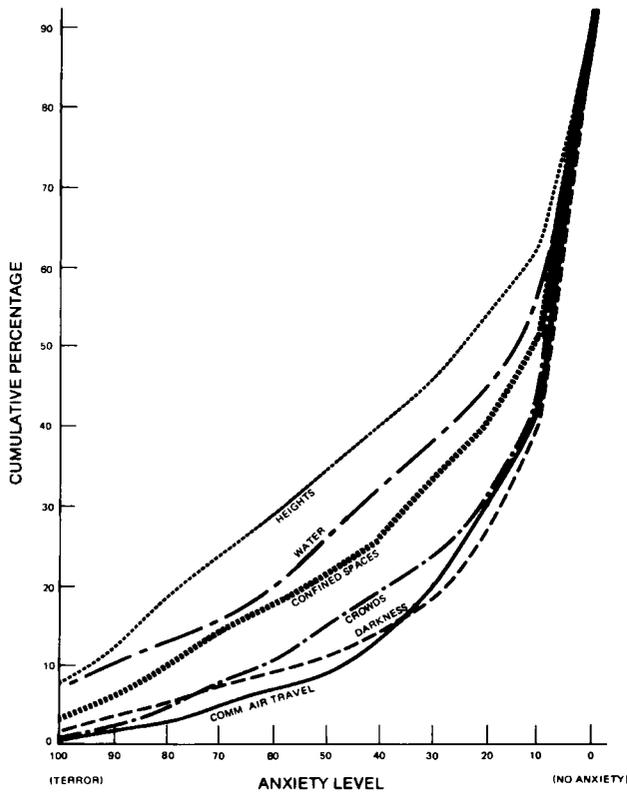
Table 4 presents the data obtained in the ORC national survey in response to the following question: "Here is a list of reasons why people avoid flying on commercial aircraft. Please look over this list and call off the reasons that apply to you." Among the list of options were "don't avoid flying" and "don't know."

It was found that 64% of the persons surveyed gave one or more reasons for avoiding commercial air travel; only 36% indicated that they do not avoid flying. The most frequently given reason was cost; 32% of the persons surveyed

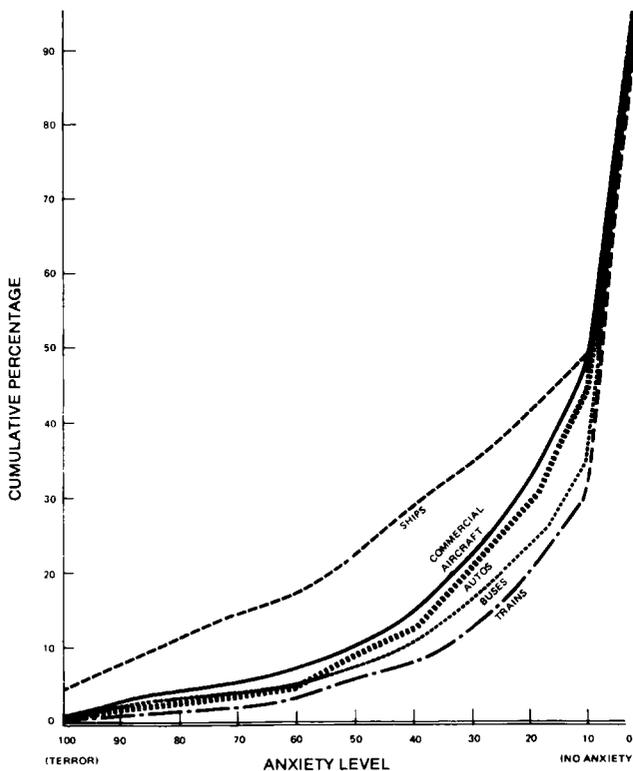


**FIGURE 6**  
**AVERAGE ANXIETY LEVELS DURING SPECIFIC AIR TRAVEL EVENTS**

**FIGURE 7**  
**CUMULATIVE DISTRIBUTION OF ANXIETY LEVELS**  
**IN DIFFERENT SITUATIONS**



**FIGURE 8**  
**CUMULATIVE DISTRIBUTION OF ANXIETY LEVELS**  
**FOR DIFFERENT MODES OF TRANSPORTATION**



indicated that they avoid flying because of cost. Among persons who were afraid of flying, however, the most frequently given reason was "afraid to fly" (48% of those who have flown on commercial aircraft and 82% of those who have never flown). "Flying is unsafe" was given relatively infrequently as a reason for avoiding flying (6% of all persons surveyed, 15% of the flyers who are afraid of flying, and 29% of the nonflyers who are afraid of flying).

**The Fearful Flyer**

The BCS/Pan Am and Pan Am surveys indicated that 89% of the persons participating in the Pan Am fearful flyer programs had flown on a commercial aircraft. On the average, they had traveled almost seven times as often on commercial aircraft as those members of the general public who are afraid of flying (3.7 one-way trips per year vs. 0.55).

Ninety-five percent indicated they were afraid of flying; the remainder were anxious about flying. They gave an average anxiety rating of 71 when traveling on commercial aircraft, compared to 50 for that segment of the general population that is afraid of flying. They consistently reported higher levels of anxiety than programmer-analysts who were afraid of flying during all in-flight aspects of air travel except landing. The fearful flyers also differed from the programmer-analysts in that (1) they reported elevated anxiety levels during check-in (but not during check-out) and (2) their anxiety during cruise was higher than during landing.

The persons participating in the fearful flyer programs were predominately female (64%) and tended to be older than the general population (76% over 30 vs. 50% for the general population). They appeared to be similar to the general population in terms of educational achievement. Fear in 51% developed after their first flight, and 73% said their fear has increased with age. Although 68% stated they had stopped flying because of their fear, 72% expected to be able to fly after completion of the program. Their primary reason for wishing to overcome their fear was for vacation travel (65%), rather than for business reasons (24%) or enhanced self-esteem (33%).

The persons participating in the fearful flyer programs appear to represent a subset of the general population of persons who are afraid of flying in that they have a much greater propensity toward commercial air travel and experience considerably higher levels of anxiety traveling by air. Using these two observations as a starting point, an attempt was made to estimate the upper limit of the number of persons who would be potential candidates for a program of the Pan Am type.

The estimate was made by first assuming that all persons who had flown on a commercial aircraft, who were afraid of flying, and who had anxiety ratings greater than 70 would be candidates for a program of the Pan Am type. (From the ORC national survey, it was estimated that 2.3% of the general population met these three conditions.) Then prorating was done on the basis of the percent of persons attending the fearful flyer programs who were flyers with anxiety ratings below 70 (25%) and who were nonflyers (13.3%). The cutoff anxiety rating of 70 was chosen because 71% of all flyers attending the programs had anxiety ratings of 70 or above. This procedure yielded an estimate that 3.7% of the general public or 22% of all persons who are afraid of flying (5.6 million persons) would be potential candidates for a program of the Pan Am type.

## CONCLUSIONS

Twenty-five million adult Americans—one out of six—are afraid of flying; one out of 10 air travelers. The most critical demographic variables are sex and socioeconomic position, since fear of flying is significantly more prevalent among women and those in the lower socioeconomic levels. The same variables, sex and socioeconomic position, are also critical with respect to the frequency of air travel, but this is because of the greater propensity toward business travel by men in the higher-income brackets.

There can be little doubt that fear of flying has a negative effect on air travel behavior. The most critical observation in this regard is that persons who describe themselves as being afraid of flying make on the average one-third as many trips on commercial aircraft as those who say they have no fear of flying. In addition, fear of flying is three times as prevalent among persons who have never flown on a commercial aircraft than among those who have flown; among those who have never flown and who are afraid of flying over 80% say they avoid flying because of their fear. Among

flyers who are afraid, almost 50% say they avoid flying because of fear.

Fear of flying is estimated to cost the domestic air travel industry \$1.6 billion annually. This estimate is based primarily on the reduction in personal travel among those in the \$5,000 to \$25,000 income range. Because of a lack of statistical significance, it was assumed for estimation purposes that fear of flying had no effect among persons in upper-income levels (above \$25,000).

It does not follow, however, that the lack of statistical significance necessarily proves that fear of flying has no effect on the above \$25,000 income group. In fact, the overall average effect (2.2 one-way trips per year for those who are afraid vs. 3.8 for those who are not) is comparable in magnitude to that for the other income groups. A similar anomaly was observed with regard to business travel in that, although the average effect of fear of flying was greater in magnitude than for personal travel (0.2 vs. 1.1 one-way trips per year for business travel and 0.4 vs. 1.1 for personal travel), the effect for business travel was less statistically significant. Since the preponderance of business travel takes

**TABLE 4**  
**REASONS FOR FLYING AVOIDANCE**

Reasons for Flying Avoidance	General Population (%)	Flyers (%) <sup>a</sup>				Nonflyers (%) <sup>b</sup>			
		Overall	No Anxiety	Anxious	Afraid	Overall	No Anxiety	Anxious	Afraid
Costs too much	32	31	28	44	38	35	33	38	37
Want my car at destination	16	16	15	18	20	17	20	23	11
Afraid to fly	15	7	2	6	48	34	6	4	82
Can get there without flying	12	7	6	9	11	25	25	16	27
Airports are a hassle	12	13	12	19	19	8	7	14	8
Cannot stop along way	11	10	9	12	15	14	12	16	17
Cannot sightsee along way	11	10	9	12	16	14	14	16	12
Cannot accept airline's schedule	7	7	6	10	8	8	7	9	9
Air travel is unsafe	6	4	2	4	15	13	3	5	29
Hard to take small children	6	6	5	10	6	5	3	5	8
Hard to take pet along	5	6	6	5	6	3	3	4	4
Airplanes are too confining	5	4	3	8	11	6	3	5	9
Cannot carry much baggage	5	5	4	8	6	3	3	2	5
Too long to get to airport	5	5	5	7	6	3	3	2	3
Not a durable product	4	3	3	5	4	5	3	4	8
Do not like the food	3	4	3	7	6	1	1	0	2
Plans to fly are a pain	3	3	2	4	4	4	3	5	5
Do not know	1	0	0	0	1	3	4	4	2
Avoid flying (overall)	64	57	51	72	86	80	69	75	98
Do not avoid flying (overall)	36	43	49	28	14	20	31	25	2
Sample size	1,942	1,369	1,040	189	140	573	306	56	211

<sup>a</sup>“Flyers” refers to persons over 18 who have flown at least once on a commercial aircraft.

<sup>b</sup>“Nonflyers” refers to persons over 18 who have never flown on a commercial aircraft.

place among the upper-income group, there may be a common explanation.

Fear of dying and fear of heights are the dominant themes of why people are afraid of flying. It appears, however, that there may be a number of distinct subpopulations so that no single explanation can account for all persons who are afraid, or perhaps even a majority. Most persons who are afraid of flying, for example, do not perceive flying to be unsafe; there are, however, sizable numbers who feel the opposite (15% of the flyers and 29% of the nonflyers). The large number of persons who have never flown, but describe themselves as being afraid, suggests that fear of flying has a large component that is independent of actual experience. The data from the Pan Am fearful flyers, in which 51% said their fear developed after their first flight and 73% said that their anxiety has increased with age, suggests that fear of flying for many people is a learned phenomenon, thus highly dependent on experience. Phobic reactions undoubtedly exist; however, the observation that levels of anxiety during commercial air travel were consistently lower than those in flight-related fear situations suggests that any simple phobic explanation (of the type: "people are afraid of flying because they're afraid of heights, confined spaces, etc.") is probably untenable. It is evident that no single approach should be used in dealing with the problem fear of flying. Rather, a wide variety of different approaches should be used to help as many as possible of the 25 million adult Americans who are afraid of flying.

The industry as a whole has a 9% potential gain in air travel through the alleviation of fear of flying. Because of the competitive nature of the domestic air travel industry, however, the potential gain is much greater than 9% for any set of airlines that could capture the market segment made up of fearful flyers. Observation of the strong preferences toward Pan American World Airways developed by those taking part in the fearful flyer program suggests that capturing sizable portions of the fear-of-flying market may be a distinct possibility, even though this may not have been the original intention. Another consideration is that when people travel in groups, for either business or personal reasons, an individual who is afraid of flying may be able to bias the entire group toward a favored airline, thus further increasing that airline's market share. It also can be speculated that successful actions to alleviate the discomfort of those who are afraid of flying may have a favorable effect on those who are anxious but not afraid, and that any airlines preferred by one group may also be favored by the other.

#### RECOMMENDATIONS FOR FUTURE ACTION

The data indicate that fear of flying is a problem of sufficient magnitude to warrant the attention of the air travel industry. The core question, then, becomes that of whether or not there is anything that can be done about it. In addition to those by Pan Am, programs dealing with fear of flying currently are being offered in New York, Atlanta, Boston, Chicago, Los Angeles, and Montreal and Vancouver Canada (Cummins 1978, Forgiione 1975, and Jones 1978).

During the past few years more than 6,700 people have received specialized training in how to cope with fear of flying. Although a wide variety of therapeutic techniques are used in these programs, familiarization with the air travel environment tends to play an integral role. Flight personnel

actively participate in the Pan Am programs; the Boston program takes place next to the flight line at Logan International Airport, and individual therapists have taken clients on tours of Boeing production facilities. It is possible to envision an integrated referral network, such that anyone in any metropolitan area in the United States need only contact a local airline to find a fear of flying program.

A systematic investigation of the long-range effectiveness of fear of flying programs should be undertaken. Although more than 90% of the persons participating in the Pan Am program go on a 2-hour flight offered as part of the training, and a 77% "cure rate" has been mentioned earlier, no information is available on whether the results are long term. The durability of treatment should be determined before the industry considers lending its support and prestige to any program of this type.

Opportunities for direct industry action in handling fear of flying should be identified. Regardless of effectiveness, it has been estimated that no more than one-fourth of the people who are afraid of flying would participate in treatment program of the Pan Am type. Moreover, it would be logistically impossible to provide formal training to even this one-fourth (over 5 million people). Every treatment professional contacted in this investigation, however, had a list of the actions industry could take directly. Among the suggested areas for concern were:

- Pilot-initiated in-flight accelerations
- Television commercials showing airplanes flying high above the clouds
- Aircraft interiors designed to accentuate being up in the air
- Cabin crew ignorance of, and lack of training to help, the 10% of passengers who are afraid

No attempt was made in this investigation to systematize the professionals' opinions to identify areas of agreement and disagreement. Such an attempt should be made to obtain a starting point in identifying actions the industry can take other than treatment programs.

A better understanding of the upper-income traveler is needed. It is within this subpopulation that the preponderance of air travel takes place, and trends in the data suggest that fear of flying may be an important factor in influencing its travel behavior. However, because of the lack of statistical significance and the concept of business replacement, this possibility deserves further investigation.

There are two reasons for concern. The first is that, in the absence of additional data, a sizable and critical segment of the population may be overlooked in dealing with fear of flying. The second is that the techniques required to deal with those in the upper-income brackets, particularly the male business traveler, may be considerably different from those required for the mid-income personal traveler. For example, the relatively small proportion of men who were concerned about business travel among those attending the Pan Am fearful flyer programs possibly suggests that such people may be reluctant to participate in formal treatment programs.

Foreign travelers, who make up a growing portion of the domestic air travel market, also may have fears of flying. Although there never has been a cross-cultural investigation of human fears, the folklore on the subject suggests that there may be extreme differences in terms of both the causes

and levels of anxiety. Care must be taken to ensure that actions designed to alleviate the anxieties of American travelers do not have a detrimental effect on travelers from foreign countries.

Accomplishment of the four objectives recommended here—assessing the effectiveness of current fear-of-flying programs, identifying alternatives for direct action by the industry, attaining a better understanding of those in the upper-income levels, and accommodating the needs of the foreign traveler—would best be done through an integrated effort by the air travel industry and the therapeutic community. Active cooperation from the therapeutic community can be assumed, for fear of flying represents an area of extreme social need, high likelihood of success, and a potential market for therapeutic services on the order of \$500 million. As long as the conditions of objectivity and scientific validity are met, any reputable professional should be willing to participate in followup assessments of program success. Their assistance would be needed in designing the assessment procedures and in obtaining access to program participants; the actual data collection and analysis should be performed by an uninvolved third party.

Professionals seem more than willing to make available their ideas on the opportunities for direct action by the industry. What is needed is a systematic procedure for bringing together representatives of the industry and therapeutic professionals in such a manner as to provide an effective basis for future action. The problem of the upper-income traveler would be best dealt with through an in-depth large-sample investigation using essentially the same techniques as were used here. The primary problem would be one of obtaining a sufficiently large sample nationally representative of the upper-income group. With regard to foreign travelers, the Japanese, Western European, and Hispanic cultures would be of most immediate concern because they make up the bulk of non-U.S. citizens traveling on domestic airlines. Data collection would be best accomplished by established survey organizations that are familiar with the populations of concern.

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