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A Survey of Pilots on the Dissemination of Safety Information

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16. Abstract

A survey was conducted to obtain information from the pilot population on perceptions of safety-related training currently being offered, its usefulness, and the process through which it might be better disseminated to the general aviation population. The questionnaire assessed use of safety information, safety awareness, computer/video use, pilot self-assessment of proficiency, demographic information, and stressful experiences. In addition, four open-ended questions were included to allow pilots to freely express themselves on a variety of safety issues. The questionnaire was sent to 6,000 pilots (approximately 2,000 each to private, commercial, and airline transport) selected randomly from the pilot population. Responses were received from 1,822 (30.4% of the sample). Of the respondents, 31.3% were private pilots, 34.2% were commercial pilots, and 34.5% were airline transport pilots. The frequency of response to all questionnaire items for the three certificate categories are provided, plus analyses of the responses of pilots in a target group consisting of all private pilots and those commercial pilots who had not flown for hire. Analyses also compared the responses of (1) seminar attendees versus non-attendees, and (2) pilots who had been in accidents versus those who had not. Recommendations to improve the attendance of pilots at FAA-sponsored safety seminars are given.

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INTRODUCTION

The dynamic and heterogeneous nature of the aviation industry is such that it is often difficult to develop a coherent understanding of how best to serve the safety information needs of various pilot segments. Aviation safety seminars presented by the Federal Aviation Administration (FAA) and other groups have been one method of providing safety-oriented information to pilots. However, the effectiveness of such programs may be debated, as voluntary attendance is often low. This suggests that the current mechanisms for the dissemination of safety information may not be meeting the particular needs of a significant number of pilots.

Previous evaluations of the pilot population have been designed primarily to examine the nature of the pilot population as a type of "snap shot" for subsequent comparisons (See Hunter, 1995). In general, the primary focus has rested upon the identification of safety-related behavior, rather than mechanisms through which unsafe behavior can be altered.

The objective of the present research was to identify pilot perceptions of safety-related information, including its usefulness within the operational environment, its role in accident causation and prevention, and the process through which safety-related information might be better disseminated to them. This study is a part of a larger research program designed to develop and disseminate aviation-related safety information to the pilot population in general. The specific goal was to determine the most effective strategies through which a broad range of pilots could be provided with relevant, innovative safety information using methods that fit the various learning styles of the population.

Segmentation of the Pilot Population

Because their experience and flying environments are quite different, private, commercial and airline transport pilots are likely to require different types of safety information. Moreover, it was considered unlikely that all pilots could be served effectively through the same mechanisms of information dissemination; that is, some methods are perhaps more appropriate for certain types of pilots. Educators know that individual learning styles vary considerably across the population. Some people learn best from lectures, some from computers, some from discussions, and still others learn best from reading.

On the basis of these factors, it was considered appropriate to segment the pilot population into subgroups that share similar characteristics in terms of experience and knowledge. The participants were thus divided into three groups on the basis of the license that they held when they were sampled. Other variables, such as a pilot's primary FAA region, recency of experience, and involvement in aircraft accidents, were used to further segment the population.

Segmentation of the pilot population also facilitated the examination of safety habits among the various pilot subgroups. Consistent with Hunter (1995), this kind of information was considered useful in establishing a profile of "at risk" pilot subgroups that coincided with appropriate safety intervention efforts.

METHOD

Questionnaire Development

The survey questions were developed to meet the objective of the study, which was to determine how best to bring safety information to the various segments of the general aviation pilot population. Therefore, it was necessary to ask how the population perceives present and proposed future methods of presenting safety. Questions were designed to examine attitudes toward FAA and non-FAA safety seminars (including best times, places, and locations) as well as alternate forms of intervention strategies (i.e., computer use, video use, etc.). Questions relating to the pilot's profile focused upon the acquisition of information relating to the characteristics of pilots including age, gender, education level, and involvement in accidents/incidents. Information from these types of questions would be used to link the responses to questions regarding FAA safety seminars to subgroups of the pilot population.

The questions were arranged in an optically-scannable questionnaire booklet under the following seven categories:

- *Use of Aviation Safety Information*
- *Seminars*
- *Computer/Video Use*
- *Self Assessment*
- *Recent Flying Experience*
- *Demographic Information*
- *Stressful Experiences*

Four optional open-ended questions, listed at the end of the survey, asked pilots to expand on their stressful flying experiences and solicited suggestions about how to improve aviation safety.

To enhance the response rate, the questionnaire was developed to be quickly understood and easy to complete within approximately 30 minutes. Some compromises in content were necessary to meet this goal as the development effort was carried out. To facilitate the survey development process and gain the best response rate, the Statistical Consulting Service and the Polimetrics Laboratory of the Ohio State University (OSU) were consulted regarding the consolidation and ordering of questions.

Pre-testing of the Survey Form

The prototype survey was pre-tested using students in OSU aviation classes and an array of local volunteer private, commercial, and airline transport pilots. The pre-test helped to determine the time required to complete the form. Pilots who participated in the pre-testing also provided valuable feedback on the questionnaire content, resulting in more clearly understood text. In some cases, questions were added and others dropped as pilots offered their own ideas. The final form of the questionnaire was an eight-page booklet (shown in Appendix A).

Sampling

A stratified random sample of the pilot population was drawn to represent three pilot groups: private, commercial, and airline transport. The database used to select pilots was the February 1995 Aviation Data CD (Avantex, 1995). This database included all airmen with valid medical certificates on December 31, 1994 who lived within the nine domestic FAA regions. Thus, the sample represented pilots who were active, at least to the point of maintaining their medical certificate. The primary information source for the CD database was the FAA, which then listed the names and addresses of approximately 240,000 private pilots, 121,000 commercial pilots, and 110,000 airline transport pilots.

The selection procedure was to draw one name for every 120 private pilots, 60 commercial pilots, and 50 airline transport pilots listed. Since the listing was ordered according to FAA region, this selection method produced a sample that was relatively characteristic of each regional population with approximately the same number of private, commercial, and airline transport pilots per region. The final sample consisted of 2,005 private pilots, 2,008 commercial pilots, and 1,973 airline transport pilots. Equal numbers of each certificate type were chosen instead of proportions of the actual total population (51%, 26%, and 23% for private, commercial, and airline transport, respectively) because the concern was to control sampling error by obtaining a suitable number of completed surveys from each population segment of interest.

Survey Procedure

Following the recommendations of Dillman (1978), pre-notification postcards were sent to all pilots in the sample, notifying them that they had been selected and requesting their participation. Approximately one week later, the survey packets were sent to the 2,000 pilots in each of these three groups. After considering the various options for follow up to improve response, it was decided that within the budget and time constraints of the study, a single mailing of another complete survey packet to the sample of pilots would offer the most effective means to improve responses. Accordingly, four weeks after the initial mailing, additional survey packets were sent out to 4,000 pilots randomly selected from among those (approximately 5,000) who had not responded. Approximately equal numbers of pilots from each of the three license categories were selected for this follow up. The figure of 4,000 was arrived at by estimating, a priori, the number of non-responding pilots that would remain after the first mailing. However, the response rate failed to meet our initial expectations, and only about 1,000 responses had been received prior to the second mailing. This left approximately 5,000 non-respondents and (because all the surveys had been printed at the same time) only 4,000 questionnaires available to be sent out. There-

fore, the follow up second mailing of the survey packet was limited to approximately 80% of the non-respondents.

The survey packet included a cover letter and a letter of endorsement. The cover letter urged recipients to respond to the survey, stressing the benefits of the survey, its 30-minute completion time and the confidentiality of responses. This cover letter was signed by the Ohio State University study director. The letter of endorsement stressed the significance of each pilot's response in contributing to aviation safety and was signed by the presidents of the Aircraft Owners and Pilots Association, Experimental Aircraft Association, General Aviation Manufacturers Association, and Small Aircraft Manufacturers Association.. In addition, the survey packet included one copy of the survey and a 9"x12" pre-paid, business reply envelope.

Mailing

The first mailing of the 5,988 surveys was dispatched on March 27, 1995. Following the initial mailing, 146 survey packets were returned undelivered, including 46 from private pilots, 56 from commercial pilots, and 44 from airline transport pilots. On April 18, 1995, 146 replacement surveys were mailed to an additional sample of pilots from each of the three categories not represented in the initial mailing.

To keep track of those pilots who had responded for second mailing purposes, sequential numbers were assigned to the return envelopes. These numbers corresponded to those printed next to the names of pilots on the address labels. Thus, each pilot had a number and the return of their questionnaire prompted elimination from the second mailout list. Since the numbering system suggested a means through which to track the responses of pilots, recipients had to be assured of the confidential nature of the survey. Consequently, the cover letter accompanying each questionnaire stated that once received, the questionnaires would be immediately separated from the return envelopes and combined with those from thousands of other pilots prior to data processing or tabulation.

Return Rates

Of the 5,988 surveys distributed, 1,822 were returned. This represented a response rate of 30.4%, and is consistent with that previously obtained by Hunter (1995). Ten questionnaires were either lost in transit or received too late to be included in the data analysis.

The response rate across license categories was relatively consistent across the three segments of the pilot population. The response rates for private, commercial, and airline transport certificate holders were 31.3%, 34.2%, and 34.5%, respectively. Thus, there were approximately 600 respondents for each of the three certificate categories. That size sample provides a sampling error 95% confidence interval of ± 4%.

Because of the substantial proportion (70%) of non-respondents, we must be concerned with the possibility of non-response bias that may occur when members of the sample differentially choose to respond or abstain based upon characteristics germane to the purpose of the survey. It is incumbent upon the researchers, in such a situation, to demonstrate to the degree possible, that such an effect has not taken place. Generally, this takes the form of comparisons of respondents with non-respondents or with the general population for such measures of interest as may be available, and the latter is the approach taken here.

Since data are not available for those pilots who did not respond, we are limited to comparing the respondents to the pilot populations from which they were drawn. However, only limited data are available for the pilot population. Two available measures are age and gender, and the sample of respondents are compared to the population for each of those variables in Table 1 (age) and Table 2 (gender). The results in Table 1 show that the sample of respondents were uniformly (and significantly) older than the populations from which they were drawn. Hence, we might suspect that any variables of interest in our survey that correlate with age might be biased. One obvious measure would be flight time. Generally, one might expect total flight time to be positively correlated with age. Therefore, the data presented later on total flight time may be somewhat inflated, compared with the true population figures, because the respondents to this survey are somewhat older.

An examination (using Chi-Square) of the proportion of male and female pilots in the general population and among the survey respondents was not significant. Thus, there appeared to be no differential proclivity to participate in the survey attributable to gender differences.

Table 1. Age of survey respondents and pilot population.

	Mean – Respondent Sample	Mean - Population
Private	46.6	42.7
Commercial	45.7	41.9
Airline Transport	45.7	44.1

Note: All differences significant ($t > 1.96$, $p < .05$).

Table 2. Gender of survey respondents and pilot population.

	Survey Respondents		Population		
	Male	Female	Male	Female	X^2
Private	93.2	6.8	94.1	5.9	0.94
Commercial	94.2	5.8	95.7	4.3	3.08
Airline Transport	96.4	3.6	97.4	2.6	2.7

Note: All X^2 ($df = 1$) nonsignificant ($p > .05$)

Table 3. Responses by FAA region.

Region	Number of Responses	Percent of Responses	Number of Pilots	Percent of Pilots
Alaska	41	2.4%	9404	1.5%
Central	96	5.6%	31853	5.1%
Eastern	249	14.5%	83220	13.2%
Great Lakes	313	18.3%	108139	17.1%
New England	75	4.4%	29653	4.7%
Northwest Mountain	160	9.3%	65859	10.4%
Southern	269	16.1%	117834	18.7%
Southwest	230	13.4%	75692	12.0%
Western Pacific	279	16.3%	108898	17.3%

Table 3 presents the number and proportion of respondents from each of the nine FAA regions.

This table also gives the number of pilots in each region and the proportion of the national total.

Recall that the sample was stratified on FAA regions; hence, the approximately equal proportions of pilots in the respondent sample and in the regions indicate there was little differential responding by regions.

In summary, slightly less than one-third of the pilots elected to take part in the survey. Caution is therefore required in interpreting the results because of the potential for non-response bias. Since we have no data on the non-respondents, other than that summarized above, we cannot say with certainty whether the results are biased. Other than the age effect noted earlier, there is no a priori reason to believe that bias is present. However, readers must keep in mind that the data in self-report surveys, particularly when based upon less than a large percentage of the potential respondents, always involve a degree of uncertainty.

RESULTS

The frequency of response to each alternative for all questions comprising the survey is provided in Appendix B for each of the three certificate levels. In addition, Appendix B provides the responses for a group (labeled Target Group) comprised of private pilots and commercial pilots who have never flown for hire. Previous research (Hunter, 1995) has indicated that a substantial proportion of commercial pilot certificate holders do not engage in commercial flying activities. Rather, they acquire a commercial certificate as a means of increasing their flying skills and, possibly, their status in the flying community. Members of this group of non-professional commercial certificate holders are very much like private pilots in many respects in terms of their demographics, flying activities and training event participation. Hence, like the private pilot certificate holders, they are the prime target group for FAA-sponsored safety seminars and other safety-related training.

Since the objective of this effort is to develop a better understanding of how to disseminate training information, the subsequent analyses will focus on this group of private and commercial pilots whose primary source of safety-training information is likely to be FAA-sponsored programs. We have defined this target group as consisting of all private pilots (N = 602) and all commercial pilots (N = 193) who reported (in Question 39) that they had never flown as a commercial pilot for hire. The total available for analysis is, therefore, 795.

Three sets of analyses are presented below. First, we provide general demographic and experience data for the target group. Second, we divided the target group into two subgroups: (1) those who had attended a FAA-sponsored safety seminar within the previous 12 months, and (2) those who had not. The responses of these two groups to certain of the questions are compared to provide information on characteristics associated with seminar attendance. Finally, we divided the target group into two subgroups: (1) those who had been in an aircraft accident (involving damage to an aircraft), and (2) those who had not. The responses of these two groups are compared to provide information on characteristics associated with accident involvement.

Target Group Characteristics

Age. Overall, the mean age of respondents in the target group was 48 (SD = 14) and ranged from 20 to 89 years. For purposes of interpretation and comparison, the age-related data were categorized into ten-year segments. The frequency distribution indicated that the largest proportion of respondents were aged from 41 to 50 years of age (see Figure 1).

These data are comparable with published FAA data (Lampl, 1996) in which the largest proportion of pilots (26.6%) is aged from 41 to 50 years. However, as noted earlier, pilots responding to the questionnaire are slightly (but significantly) older than would have been expected on the basis of the population.

Gender. In the target group, 94% of the sample were males, and 6% were females.

Education Level. As a part of the process of determining the capabilities of the pilot population, respondents were asked to indicate the highest educational level they had attained. The frequency distribution (see Table 4) indicated that the majority of respondents had obtained at least a college degree.

Accidents. Of the pilots in the target group, 2% indicated that they had been involved in an aircraft accident resulting in damage to property (other than the aircraft), and 2% had been involved in an aircraft accident resulting in personal injury.

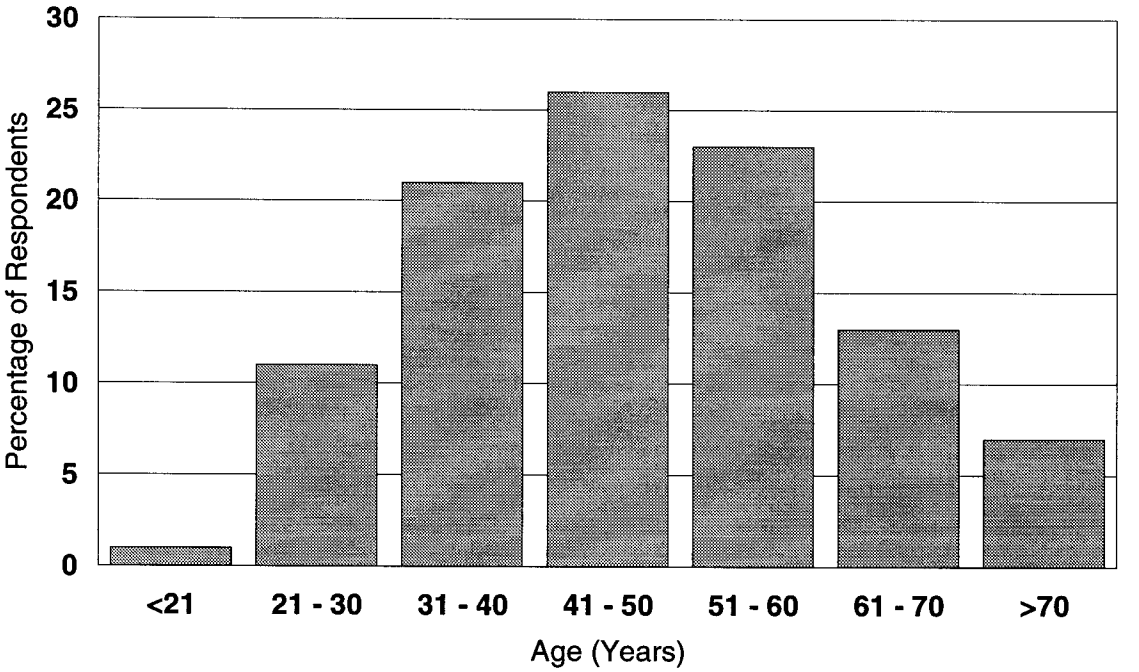

Figure 1. Frequency distribution of respondents across age categories.

Table 4. Educational level of respondents in the target group.

Highest Completed	Percent
Grade School	1%
High School	21%
Associate Degree	16%
College Degree	35%
Master's Degree	18%
Professional Degree	10%

Fifteen percent of pilots reported being involved in aircraft accidents resulting in damage to the aircraft. This figure is relatively larger than that evident in either of the previous categories, and is consistent with accident and incident statistics which show that most accidents or incidents involve damage only to an aircraft with little or no damage to either personnel or property.

Number of Stressful Situations in the Last 12 Months. Considerable anecdotal evidence suggests that stressful experiences play a major part in both incidents and accidents and may contribute significantly to pilots' subsequent use of safety-related information (Jensen, 1995). Such stressful experiences may range from life stressors, such as a death or divorce, to more task-related stressors, such as passenger or job-related demands.

Forty-six percent of pilots indicated that they had experienced a stressful aviation event during the 12 months prior to completion of the survey.

For those pilots in the target group who reported having a stressful event, the distribution of factors contributing to the event are given in Table 5.

Analysis of the types of stressful events experienced by pilots revealed that weather is the primary factor contributing to stressful events during flights, followed closely by mechanical problems with the aircraft. Mistakes attributed to pilots in other aircraft also account for a substantial number of stressful events, as do bad decisions made by the pilots themselves.

Self-Assessment of Pilot Knowledge. Pilots were asked to rate their level of knowledge or proficiency in 12 areas using a 5-point scale from "Poor" (1) to "Excellent" (5). Table 6 presents the mean self-ratings from the target group for the 12 knowledge and proficiency areas.

Topics Presented at FAA Seminars. As a means of determining the relative usefulness of topics presented at FAA seminars, respondents were asked to indicate whether a particular topic was presented at the last FAA safety seminar they attended, and further, to indicate the relative usefulness of the topic. The mean usefulness ratings (1 to 5 scale, higher scores indicate higher usefulness) for the topics are listed in Table 7. In addition, the frequency of pilots who indicated that these topics were presented at the last FAA safety seminar they attended is given.

Table 5. Frequency of factors contributing to stressful events.

Factor	None	1 – 2 Times	3 or More Times
Fuel problems	86%	12%	2%
Mistakes by other pilots	69%	24%	7%
Navigational problems	82%	16%	1%
Physiological problems (i.e., illness)	88%	10%	2%
Family commitments	93%	6%	1%
Passenger requirements	91%	9%	0%
Job-related demands	89%	8%	3%
A bad decision	74%	22%	4%
Mechanical problem with airplane	57%	37%	6%
Weather	51%	42%	7%
Other	72%	23%	5%

Table 6. Mean self-assessments of knowledge and proficiency.

Knowledge & Proficiency Area	Mean Self-Rating (S.D.)
Ground handling	4.1 (0.74)
Basic VFR flying techniques	4.1 (0.72)
Navigation	4.0 (0.78)
Preflight planning	4.0 (0.76)
Takeoff and landing procedures	4.0 (0.75)
Aviator decision making	3.9 (0.78)
Human factors	3.7 (0.83)
Weather and its impact on flight	3.7 (0.92)
Air traffic control procedures	3.5 (0.93)
Air space regulations	3.3 (0.87)
Emergency procedures	3.3 (0.85)
Instrument flying procedures	2.7 (1.25)

Table 7. Frequency of pilots who indicated that various topics were presented at safety seminars and the mean usefulness associated with each topic presented.

Topic	N	Mean Usefulness (S.D.)
Air Space Classification	222	3.81 (1.05)
Pilot Decision Making	184	3.78 (0.97)
Operation Procedures (IFR or VFR)	178	3.75 (0.95)
Weather	179	3.72 (1.08)
Human Factors	162	3.72 (1.05)
Air Traffic Control Procedures	175	3.70 (1.02)
FAA Regulations	222	3.57 (0.99)
Takeoffs and Landings	102	3.49 (1.14)
Aircraft Systems	61	3.30 (1.19)

Inspection of the mean ratings of usefulness associated with each topic indicates that pilots perceived air space classification and pilot decision-making as the most useful topics examined during seminars. Pilots indicated that the least useful of the seminar topics were aircraft systems and takeoffs and landings. Overall, the mean usefulness of the topics examined during FAA seminars was 3.6, which can be regarded as moderately useful along the five-point scale.

Location and Structure of FAA Safety Seminars. For most pilots, the preferred location for FAA safety seminars was a fixed-base operator (FBO) or flying club (33%), followed closely by a school or college classroom (27%). The least popular location was a friend's house (<1%).

In terms of class size, the majority of pilots (76%) selected between 10 and 50 participants, while considerably less support was indicated for seminars with 50 to 100 participants (15%), less than 10 participants (7%), and greater than 100 participants (3%).

The preference for a particular day on which to hold a FAA safety seminar was less clear although pilots preferred not to have seminars on either Fridays or Sundays (See Table 8).

On the basis of these results, it would appear that either Wednesday or Saturday would be the preferred day on which to hold FAA safety seminars. In terms of the time of day, the majority of respondents selected the evening (70%), rather than the morning (19%) or the afternoon (11%).

The majority of respondents considered 60 to 90 minutes (61%) to be the optimal duration of FAA safety seminars. There was considerably less support for 30 to 60 minutes (22%), more than 90 minutes (17%), or less than 30 minutes (1%).

Use of Computer Technology. Overall, 71% of respondents indicated that they had used a computer at home, while 36% indicated that they were likely to purchase a computer during the 12 months following the survey. Seventy-nine percent of pilots indicated that they would certainly (41%) or possibly (38%) use an interactive, computer-based safety program provided by the FAA.

Table 8. Preferred day for seminars.

Day of Week	Percent
Monday	10%
Tuesday	16%
Wednesday	24%
Thursday	13%
Friday	7%
Saturday	27%
Sunday	5%

The majority of respondents indicated that they would purchase a copy of the program from the FAA, and about half (45%) were willing to pay $10 to $30 for a copy.

There was some disagreement in terms of the optimal method through which to obtain a copy of the computer program. Twenty-two percent of respondents indicated that they preferred to download the program from the Internet; 3% indicated that they preferred to purchase a copy at their local computer store; 47% of respondents indicated that they preferred to mail order a copy; and, 20% indicated that they preferred to purchase a copy from their local FBO.

In terms of the types of computers used by respondents, 11% indicated that they had access to a Macintosh computer, 60% indicated that they had access to an IBM-compatible computer, 46% of respondents indicated that they had a computer equipped with a diskette drive, 23% indicated that they had access to email, and 31% of respondents indicated that they had a computer equipped with a CD-ROM.

Use of Video Technology. The use of video technology is becoming more and more widespread as a means of improving aviation safety and pilot proficiency. Overall, 60% of respondents indicated that they had watched a video related to aviation safety. Moreover, 92% of respondents indicated that they would either certainly (52%) or possibly (40%) be prepared to watch an aviation safety video prepared by the FAA.

The responses regarding the optimal process through which to acquire videotaped material were relatively consistent across the options with 21% and 24% of respondents indicating that they would prefer to access aviation safety videos via their local Flight Standards District Office (FSDO) or video rental store, respectively. Thirty-four percent of respondents indicated that they would prefer to acquire a video from their local library, while only 3% indicated that they would prefer to acquire an aviation safety video from their local grocery store.

Consistent with previous results (Hunter, 1997), half of the pilots were willing to spend between $5.00 and $10.00 to purchase a copy of an FAA aviation safety video, and 90% would pay $3.00 or more to rent a video.

Comparative Analysis - FAA Safety Seminar Attendees and Non-attendees

Factors that Influence Seminar Attendance

Two of the primary aims of this research were to determine the frequency with which pilots attended FAA safety seminars, and to determine strategies through which attendance and learning among pilots could be improved. Initial frequency analyses revealed that 59% of respondents in the target group indicated that they had not attended a FAA-sponsored seminar during the 12 months prior to completion of the survey, while 21%, 12%, and 8% had attended 1, 2, and 3 or more seminars, respectively.

To determine the reasons associated with seminar attendance, the sample was divided into two groups on the basis of their attendance of at least one seminar during the 12 months prior to testing. Analyses were then conducted that compared the two groups on: (1) the perceptions of pilots regarding FAA-sponsored seminars; and, (2) factors that affect their attendance decision.

In the tables that follow, the means and standard deviations of the ratings for the two groups are given. The differences between the means are compared using a t-test, and the value of the obtained t-statistic is given, along with the exact significance of that t-statistic (Computed by SPSS for Windows, Version 8.0). Because of the large number of comparisons, Bonferroni adjustments to the significance levels were also computed and are given in each table. The Bonferroni adjustments were arrived at by simply multiplying the obtained exact significance by the number of comparisons in that particular table. Although the Bonferroni procedure is rather conservative, it serves fairly well in controlling the overall Type I error rate in a set of comparisons. However, it also produces some probability values greater than 1.0, by virtue of multiplying the obtained probabilities by the number of comparisons. In those cases the reader may simply consider that it is unlikely that the obtained results represent any true difference in the population.

The pilots were asked to indicate on a five-point scale their perceptions of several aspects of FAA safety seminars. Verbal anchors were provided for each scale. Table 9 presents the mean ratings on each scale for the attendee and non-attendee groups, along with the verbal anchors used in each scale. The attendees and non-attendees differed significantly on their perceptions of four aspects of FAA seminars. Compared with non-attendees, seminar attendees perceived FAA seminars as being more interesting, well publicized, and well organized. In addition, attendees believed that pilots attend seminars to learn, as opposed to socialize.

Respondents were asked to rate ten factors on a five-point scale from "not important" (1) to "very important" (5) in terms of the extent to which each factor influenced the decision to attend a safety seminar. As shown in Table 10, only the factor of "Other Priorities" showed a significant difference between attendees and non-attendees. Non-attendees indicated that this factor affected their attendance decision more than did attendees.

Prior to developing strategies that would encourage pilot attendance at seminars in the future, it is important to ascertain the factors that motivate pilots to attend safety seminars. This information would provide important guidelines for the development of strategies to encourage pilots to attend safety seminars on a more frequent basis.

Table 11 shows a contrast between the concerns of seminar attendees and non-attendees regarding the best way to improve seminar attendance. Specifically, attendees are concerned about getting more exciting presentations (selected by 25% of attendees) while non-attendees expressed the most concern over providing a better meeting location (23%). These results are consistent with previous observations that there is a requirement for more exciting, interesting and relevant topics, presented in a venue that does not require significant "effort" for attendance.

Seminar Format

To determine the optimal nature of the format for safety seminars, respondents were asked to indicate their preferred safety seminar format. This provided the basis for the frequency distribution of responses in Table 12.

Clearly, the results shown in Table 12 indicate that respondents in both groups preferred "lectures by experts" as the optimal format for safety seminars. Video or slide presentations were the next preferred format, with the preferences of the two groups being virtually identical.

Table 9. Perceptions of seminar attendees and non-attendees regarding FAA safety seminars.

	Attended Seminar	N	Mean	S.D	t-test	p	Bonferroni Adjusted-p
FAA seminars primarily are designed for...	No	436	4.49	.88			
FAA seminars primarily are designed for...	No	436	4.49	.88			
(Poor Pilots...All Pilots)	Yes	315	4.55	.78	1.017	.309	2.16
The presentations at FAA seminars are...	No	420	3.42	1.04			
(Boring...Interesting)	Yes	315	3.70	.96	3.769	.0001	.0007
The topics discussed at FAA seminars are...	No	421	3.12	.71			
(Too Complex...Too Easy)	Yes	314	3.17	.61	0.976	.329	2.30
The material presented at FAA seminars is...	No	417	2.87	.92			
(Repetitive...Innovative)	Yes	314	2.92	.97	.763	.445	3.115
Most pilots go to FAA seminars to...	No	421	3.73	1.09			
(Socialize...Learn)	Yes	313	3.96	.93	3.020	.003	.02
Most FAA seminars are...	No	426	3.29	1.30			
(Poorly ...Well Publicized)	Yes	312	3.68	1.24	4.099	.0001	.0007
Most FAA seminars are...	No	420	3.58	1.04			
(Poorly...Well Organized)	Yes	313	3.90	1.01	4.148	.0001	.0007

Table 10. Factors affecting attendance decision by seminar attendees and non-attendees.

	Attended Seminar	N	Mean	S.D	t-test	p	Bonferroni Adjusted-p
Time	No	426	4.21	1.14			
	Yes	283	4.00	1.12	2.396	.017	.17
Money	No	416	2.82	1.42			
	Yes	278	2.62	1.34	1.884	.060	.60
Interest	No	420	4.33	.80			
	Yes	286	4.31	.81	0.244	.807	8.07
Motivation	No	404	3.84	1.05			
	Yes	273	3.79	1.03	0.630	.529	5.29
Effort	No	402	3.53	1.11			
	Yes	266	3.36	1.01	1.971	.049	.49
Other priorities	No	397	3.70	1.16			
	Yes	261	3.31	1.13	4.184	.0001	.001
Confidence	No	397	2.83	1.32			
	Yes	262	2.94	1.26	1.089	.276	2.76
Support from family	No	401	2.11	1.25			
	Yes	267	2.12	1.32	0.088	.930	9.3
Peer pressure	No	395	1.61	.95			
	Yes	266	1.47	.86	1.930	.054	.54
Fear of failure	No	397	1.56	.96			
	Yes	268	1.46	.84	1.423	.155	1.55

Table 11. Best way to encourage future attendance.

	Total	Attendees	Non-Attendees
Discuss more relevant topics	12%	13%	12%
Offer more exciting presentations	12%	25%	9%
Provide better meeting location	19%	13%	23%
Set more convenient meeting time	9%	7%	11%
Provide child care	1%	--	1%
Provide better publicity	14%	9%	17%
Get more of my friends to attend	1%	--	1%
Other	5%	4%	6%
Do nothing, I will never attend	3%	1%	4%
Do nothing, I always try to attend	25%	37%	16%

Note: Columns may not sum to 100%, due to rounding.

Table 12. Preferred seminar format.

	Total	Attendees	Non-Attendees
Lectures by experts & question and answer period	55%	52%	56%
Testimonials by fellow pilots & question and answer period	6%	3%	8%
Open group discussion	2%	1%	3%
Town meeting format -- no set agenda, leader answers questions raised by group	1%	1%	1%
Small group discussion on single topic followed by large group discussion	3%	1%	4%
Video or slide presentation followed by discussion	29%	37%	23%
Practice exam on topic(s) followed by a question and answer period about exam	3%	2%	3%
Other	3%	4%	2%

These results may be subject to some bias, because respondents may never have been exposed to some of the formats suggested. For example, in an earlier study (Guilkey, Jensen, & Hunter, 1998), responses to the "Personal Minimums" field test indicated a very high acceptance of discussion in small-group formats.

Comparative Analysis—Accident/Incident Involvement and Safety Training

Safety Activities

In addition to attending safety seminars, there are many other activities that pilots could undertake to improve their safety. The first question in the survey asked pilots to indicate (using a 10-point scale) how often during the previous 12 months they had performed several activities that might be related to aviation safety. Table 13 compares the responses of seminar attendees and non-attendees on these safety-related activities. Significant differences between the two groups were found for three activities: watching safety videos, reading magazine articles on safety, and reading FAA publications. Differences between the two groups on two of these activities (watching safety videos and reading FAA publications) are easily explained, since these are common elements of FAA safety seminars.

Self-Assessments of Proficiency

Pilots were asked to provide a self-assessment of their level of knowledge or proficiency in each of the areas shown in Table 14. Ratings were given on a five-point scale, ranging from "Poor" (1) to "Excellent" (5). Lower values indicate lower proficiency or knowledge. No significant differences were found between the two groups: however, in every comparison, the non-attendees rated themselves as higher (i.e., more proficient or knowledgeable) than the attendees.

Pilots were also asked to compare themselves with other pilots on several factors, using a five-point, Likert-type scale. Responses ranged from "Strongly Disagree" (1) to "Strongly Agree" (5). As shown in Table 15, only one item showed a significant difference between attendees and non-attendees: seminar attendees agreed more strongly that they were willing to study safety than non-attendees.

As noted previously, pilots were asked whether they had been involved in an accident or incident resulting in damage to an aircraft. In the target group, 114 pilots indicated they had been involved in such an accident/incident, while 638 responded that they had not. To examine the relationship between responses to certain of the survey items and accident/incident involvement, two subgroups of the target group were formed based upon reported accident/incident involvement. A series of independent sample mean comparisons between the two groups was then conducted. As before, because of the large number of comparisons, the Bonferroni adjustments to the significance levels are also reported.

Use of Safety Resources

The analysis of safety resources was designed to determine the extent to which accident/incident involvement was associated with the utilization of safety-related resources by pilots during the 12 months prior to the survey. The first item in the survey asked how often, over the last 12 months, the pilot had performed any of 10 safety-related activities. Table 16 shows the results of these comparisons.

Of the ten safety-related activities, only "Hired a CFI for training" showed a significant difference between the two groups. Pilots who had not had an accident/incident had hired a CFI more often than those pilots who had been in an accident/incident. The item relating to reading a magazine article on safety approached statistical significance, and the direction of the effect was the same (safer pilots more likely to engage in the activity).

One safety-related activity of prime concern to the FAA is attendance at FAA-sponsored safety seminars. Seventeen percent of the pilots in the target group who had not been to at least one seminar in the previous 12 months reported having been in an accident involving damage to an aircraft, compared with 13% of the pilots who had been to one or more seminars. These results can be compared with those previously found by Hunter (1995). In that study, 13% of pilots in a similarly constructed target group, who had not been to at least one seminar in the previous 12 months, reported being in an accident, compared to 12% of the pilots who had been to one or more seminars. This difference in accident rates

Table 13. Safety-related activities.

	Attended Seminar	N	Mean	S.D.	t-test	p	Bonferroni Adjusted –p
Used a computer flight simulation program	No	445	1.89	3.21	1.284	.200	2
	Yes	313	2.19	3.19			
Read a book on aviation safety	No	444	2.34	2.92	2.566	.010	.1
	Yes	311	2.90	3.00			
Viewed a video on aviation safety	No	436	1.32	2.09	5.783	.0001	.001
	Yes	310	2.26	2.34			
Read a magazine article on safety	No	445	6.31	3.13	4.557	.0001	.001
	Yes	311	7.28	2.51			
Hired a CFI for training	No	446	2.31	3.07			
	Yes	308	2.87	3.02	2.462	.014	.14
Read an FAA publication	No	440	3.89	3.02			
	Yes	310	4.95	2.87	4.808	.0001	.001
Referred to an aircraft operating manual	No	445	4.90	3.36	0.691	.490	4.9
	Yes	312	5.06	2.98			
Asked another pilot a safety question	No	447	3.64	3.24	1.512	.131	1.31
	Yes	310	4.00	3.08			
Answered another pilots safety question	No	446	2.69	2.97	2.284	.023	.23
	Yes	308	3.20	3.08			
Used a computer-based learning program	No	443	1.04	2.39	0.523	.601	6.01
	Yes	313	1.14	2.43			

approached but did not achieve significance (Fisher's Exact Test p = .114; one-sided). Similarly, in the current study, the difference between groups approaches but does not achieve statistical significance (Fisher's Exact Test p=.065; one-sided). Table 17 shows the relationship between seminar attendance and accident involvement in more detail. As in the overall test, of course, the differences do not attain statistical significance.

Self-Assessment of Knowledge and Proficiency

Pilots were asked to rate their level of knowledge or proficiency as a pilot in each of several areas, using a 5-point scale from "Poor" (1) to "Excellent" (5). Table 18 compares the mean self-ratings of those pilots who had been in an accident with the mean self-ratings of those pilots who had not been in an accident. Significant differences were noted for (1) basic VFR flying techniques, (2) emergency procedures, and (3) weather and its impact on flight. In

Table 14. Self-assessments of knowledge or proficiency.

	Attended Seminar	N	Mean	Std. Deviation	t-test	p	Bonferroni Adjusted-p
Preflight planning	No	449	4.07	.79			
	Yes	313	3.98	.69	1.570	.117	1.40
Ground handling	No	447	4.11	.76			
	Yes	312	4.03	.70	1.542	.124	1.49
Takeoff and landing procedures	No	444	4.05	.74			
	Yes	312	3.90	.73	2.706	.007	.08
Basic VFR flying techniques	No	444	4.14	.71			
	Yes	310	4.08	.69	1.189	.235	2.82
Instrument flying procedures	No	438	2.72	1.29			
	Yes	303	2.60	1.17	1.321	.187	2.24
Emergency procedures	No	447	3.38	.86			
	Yes	313	3.25	.80	2.142	.032	.38
Weather and its impact on flight	No	446	3.68	.92			
	Yes	313	3.61	.90	0.914	.361	4.33
Air traffic control procedures	No	444	3.4	.96			
	Yes	313	3.48	.88	0.203	.839	10.07
Navigation	No	448	4.97	.77			
	Yes	310	4.03	.77	0.569	.569	6.83
Aviator decision-making	No	444	3.92	.80			
	Yes	311	3.82	.72	1.684	.093	1.16
Human factors	No	442	3.72	.85			
	Yes	309	3.59	.80	1.989	.047	.56
Air space regulations	No	446	3.21	.91			
	Yes	312	3.31	.80	1.558	.120	1.44

these three areas, and in all other areas except for air space regulations, pilots who had been in an accident rated their level of knowledge and proficiency higher that did the pilots who had not been in an accident.

Comparisons With Other Pilots

There were no significant differences found for the two accident involvement groups with respect to comparisons with other pilots (See Table 19).

Stressful Events During the Previous 12 Months

The impact of stressful events is often regarded both as an important factor in determining pilot performance during flight and a motivator to learn more about the topic (Air Accidents Investigation Branch, 1988). Comparison of the two accident involvement groups, as shown in Table 20, showed no significant differences on the source of stressful events between the two groups.

Table 15. Self-comparisons with other pilots.

	Attended Seminar	N	Mean	S.D.	t-test	p	Bonferroni Adjusted-p
I am more safety conscious	No	443	3.81	.74			
	Yes	306	3.80	.73	0.299	.765	6.89
I am more willing to study safety	No	443	3.62	.71			
	Yes	309	3.78	.76	3.004	.003	.027
I do better on FAA written exams	No	441	3.41	.83			
	Yes	309	3.43	.80	.0286	.775	6.98
I do better on FAA check rides	No	441	3.29	.68			
	Yes	307	3.16	.62	2.497	.013	.12
I am willing to do more to be a safe pilot	No	441	3.96	.70			
	Yes	310	4.03	.70	1.475	.141	1.27
I have had fewer "close calls	No	443	3.69	.85			
	Yes	309	3.57	.88	1.823	.069	.62
I know more about the causes of accidents	No	441	3.42	.79	0.083	.934	8.41
	Yes	307	3.42	.81			
I am more interested in safety issues	No	441	3.61	.72			
	Yes	306	3.69	.79	1.489	.137	1.23
I take fewer risks when flying	No	448	4.01	.77			
	Yes	310	3.99	.78	0.362	.718	6.46

VFR Minima

Anecdotal evidence has indicated for some time that VFR pilots who consistently operate in conditions that require an instrument rating are more likely to be involved in an aircraft accident. The aim of this analysis was, therefore, to determine the extent to which pilots have operated in actual or potential instrument meteorological conditions (IMC), and whether this affected accident involvement. As shown in Table 21, no significant differences were found, although the activity "Flown VFR under a 1500 AGL ceiling" approached significance.

Summary of Qualitative Results

A series of open-ended questions was used to provide pilots with an opportunity to describe a situation that altered their knowledge or attitude about flying, and whether this experience resulted in more- or less-cautious behavior. In addition, pilots were given the opportunity to express their opinions regarding the aviation safety system in general, and the FAA in particular.

Question 1

This question was designed to provide pilots with an opportunity to recount a situation which had altered in a significant way either their knowledge or attitude about flying. Seventy-six percent of pilots responded to this question, and there were a number of key themes running through the responses. First, the majority of experiences resulted from unintentional behavior in which pilots were often "caught" unaware by the circumstances. These situations ranged from those that were weather-related, such as,

> Two years after receiving IFR rating, flew a Piper PA28-180 into known instrument conditions without a heated Pitot Tube. This was a rental plane that was well equipped for the IMC except for the Pitot tube.

Table 16. Accident involvement and safety-related activities.

	Damage to an aircraft?	N	Mean	S.D.	t	p	Bonferroni Adjusted-p
Used a computer flight simulation program	Yes	111	1.37	2.83	2.371	.018	.18
	No	636	2.15	3.25			
Read a book on aviation safety	Yes	111	2.29	2.83	1.205	.229	2.29
	No	632	2.66	2.99			
Viewed a video on aviation safety	Yes	110	1.49	2.18	1.434	.152	1.52
	No	622	1.83	2.35			
Read a magazine article on safety	Yes	112	6.00	3.18	2.751	.006	.06
	No	632	6.83	2.88			
Hired a CFI for training	Yes	110	1.65	2.45	3.411	.001	.01
	No	632	2.73	3.15			
Read a FAA publication	Yes	110	3.98	3.02	1.426	.154	1.54
	No	623	4.42	3.03			
Referred to an aircraft operating manual	Yes	110	4.68	3.38	1.126	.261	2.61
	No	636	5.05	3.19			
Asked another pilot a safety question	Yes	111	3.60	3.05	.945	.345	3.54
	No	634	3.91	3.24			
Answered another pilots safety question	Yes	112	3.25	3.12	1.182	.237	2.37
	No	631	2.88	3.03			
Used a computer-based learning program	Yes	111	.99	2.33	-.564	.573	5.73
	No	634	1.13	2.42			

Table 17. Accident involvement and FAA-sponsored seminar attendance.

Number of Seminars Attended	Damage – Yes	Damage - No
None	66%	58%
One	21%	20%
Two	5%	14%
Three	4%	6%
Four or more	4%	2%

X^2=8.4, p = .078 (N.S.)

Table 18. Accident involvement and self-assessment of knowledge and proficiency.

	Damage to an aircraft?	N	Mean	S.D.	t	p	Bonferroni adjusted-p
Preflight planning	Yes	112	4.15	.76	1.676	.094	1.128
	No	642	4.02	.74			
Ground handling	Yes	112	4.22	.70	2.183	.029	0.348
	No	640	4.05	.74			
Takeoff and landing procedures	Yes	110	4.16	.71	2.494	.013	0.156
	No	639	3.97	.75			
Basic VFR flying techniques	Yes	110	4.30	.64	2.901	.004	0.048
	No	635	4.08	.72			
Instrument flying procedures	Yes	108	2.90	1.32	2.070	.039	0.468
	No	625	2.63	1.23			
Emergency procedures	Yes	111	3.58	.88	3.221	.001	0.012
	No	641	3.30	.82			
Weather and its impact on flight	Yes	111	4.04	.85	4.639	.000	0.0012
	No	641	3.61	.90	4.826		
Air traffic control procedures	Yes	111	3.59	.93	1.317	.188	2.256
	No	638	3.46	.92			
Navigation	Yes	111	4.32	.78	2.431	.015	0.18
	No	640	4.03	.76			
Aviator decision-making	Yes	110	3.96	.84	1.010	.313	3.756
	No	638	3.88	.76			
Human factors	Yes	108	3.68	.91	.164	.870	10.44
	No	635	3.76	.82			
Air space regulations	Yes	111	3.25	.91	.045	.964	11.568
	No	640	3.25	.85			

No ice was forecasted, however, ice was encountered. Could have been a real serious situation if ceiling was lower. Lost use of instruments for 5 min [S600].

Tried to climb through hole to get on top, ran out of room. Clouds were thicker than I thought. After that I would measure the holes by sunshine on ground, sec-lines etc [S031].

...to those that were performance-related such as,

Forgot pitot heat in IMC, lost RAM air, gear safety light on (PA28-R) should have had more training on pitot heat [S298].

Single Engine Bonanza, catastrophic engine failure that cracked the case. My attitude was changed/strengthened. As a flight instructor on this flight, with the throw over yoke type of control column, I chose to let the left seat pilot make the approach and land. This was a checkout in this aircraft for insurance purposes, prior to purchase. We were in the last hour of a required 10 hour checkout. Good emergency procedures knowledge, practice, and remaining calm following the procedures gave us a successful outcome [1168].

There were very few cases in which pilots reported that they had deliberately violated regulations or minima.

Second, unexpected or unpredicted weather conditions contributed significantly to pilots developing more conservative minima when dealing with in-flight weather conditions. For example,

On one occasion, I ventured on a short (55 mile) cross-country flight to satisfy my private pilot requirements. Weather was acceptable but not great because of a haze layer. I had traveled the route twice previously with no problems. I thought I'd have no problems because of previous success and short distance. Within 20 minutes of departure, I found myself disoriented because of the haze. Fortunately I remained calm and eventually spotted a familiar landmark. This taught me to never take anything for granted (i.e., I've taken things for granted before) and to stay focused on all trips [S365].

Third, a number of pilots indicated that they had been subject to "peer pressure" or management pressure. For example,

As a private pilot, I succumbed to the "get-home-itis" of myself and my passengers after a weekend flight, which resulted in flying into deteriorating weather toward rising terrain. Fortunately, I climbed through a break in the OVERCAST and continued VFR on top and was lucky enough to find another isolated break close to my destination. I succeeded in getting home through luck, not skill, and have never succumbed to peer pressure and "get-home-itis" since. I am just glad this was a learning experience instead of my last flight [S547].

While flying a contract, another pilot and I were discussing the bad weather (it was 3rd week in December). The boss overheard us and came into the pilot office. His exact words were: I am not pushing you to flying. However, if you think the weather is bad tonight and you want your job tomorrow night, it better be bad enough that nobody else is flying either! I crashed three days later in freezing rain on ILS approach [1045].

Finally, a number of pilots indicated that the most stressful experience that they had encountered involved a failure to see-and-avoid. The resulting near misses were described by a number of pilots,

The most stressful situations I have encountered in my flying career have been, without a doubt two, maybe three near misses during my training and while I have flight instructed. I am positive each situation could have been avoided had it not been for complacency or getting too comfortable in the plane [0645].

Near mid-air collision, while instructing an instrument flight student. It was a hazy day, the student was under the hood. I looked down to write something on my clipboard-when I looked up a second later we were flying head on with another single engine aircraft. That aircraft flew below us by about 30 feet. I don't think they even saw us [0671].

Collectively, these results suggest that the factors that contribute most to pilot learning in the cockpit are those for which there is very little practical experience within the training environment. In the majority of these cases, the pilots appeared unaware of the significance of their behavior until it was almost too late to recover. One of the limitations associated with the existing pilot training environment is that inexperienced pilots are not often exposed to deteriorating weather conditions or a variety of in-flight failures. This lack is probably due to a combination of factors, including the costs involved over and above existing training systems and the difficulty in simulating the events safely.

Table 19. Comparisons with other pilots by accident involvement groups.

	Damage to an aircraft?	N	Mean	S.D.	t	p	Bonferroni adjusted-p
I am more safety conscious	Yes	110	3.75	.66	.816	.415	3.735
	No	632	3.81	.74			
I am more willing to study safety	Yes	110	3.67	.70	.161	.872	7.848
	No	635	3.68	.74			
I do better on FAA written exams	Yes	109	3.31	.75	1.434	.152	1.368
	No	634	3.43	.82			
I do better on FAA check rides	Yes	111	3.22	.61	.393	.694	6.246
	No	630	3.25	.68			
I am willing to do more to be a safe pilot	Yes	111	3.94	.77	.695	.487	4.383
	No	633	3.99	.70			
I have had fewer "close calls	Yes	111	3.53	.80	1.516	.130	1.17
	No	634	3.66	.86			
I know more about the causes of accidents	Yes	110	3.55	.77	1.835	.067	0.603
	No	631	3.40	.80			
I am more interested in safety issues	Yes	111	3.68	.71	.508	.612	5.508
	No	630	3.64	.77			
I take fewer risks when flying	Yes	112	3.92	.75	.754	.451	4.059
	No	639	3.99	.81			

Question 2

Question two was designed to determine the extent to which the circumstances described in question one led pilots to become more or less cautious with regard to their flying capabilities. Of the pilots surveyed, 74% responded to this question with the majority indicating that such stressful experiences made them more cautious concerning these events and less likely to make the same mistakes again. For example:

> Fortunately the ice blocked off the tube enough to kill the engine during the flare and not on final or before. The experience definitely made me more careful and thoughtful, because I have learned from my carelessness; if the engine would have quit 5 to 10 seconds earlier, it could have killed me [082].

> It absolutely made me more cautious. I do not like to be foolhardy, and would not have ever felt "rewarded". I also believe my perception of the danger (or potential) was accurate. However, the folks at the GA terminal presumed that it made me less safe — this attitude was nearly more damaging then the event itself, because I felt distrust, which undermined my confidence even further [283].

In some cases, pilots indicated that the experiences enhanced "higher level" cognitive skills such as situation awareness. As a case in point:

> The result of that experience was that I learned to monitor all phases of the landing (airspeed, attitude, glide path, runway alignment, flap position, etc.) and not focus on one thing (in this case, the need to satisfy my training of "putting it on the numbers"). It certainly did make me more cautious and did not make me feel I could take more chances [247].

Table 20. Source of stressful events.

	Damage to an aircraft?	N	Mean	S.D.	t	p	Bonferroni adjusted-p
Fuel problems?	Yes	55	.21	.49	.597	.551	5.51
	No	309	.17	.54			
Mistakes made by pilots in other aircraft?	Yes	49	.46	1.08	.863	.389	3.89
	No	306	.61	1.12			
Navigational problems?	Yes	49	.16	.62	.985	.325	3.25
	No	309	.25	.63			
Physiological problems (e.g., illness, fatigue)?	Yes	49	.22	.77	.136	.892	8.92
	No	301	.20	.71			
Family commitments?	Yes	48	.06	.24	.705	.481	4.81
	No	303	.11	.51			
Passenger requirements?	Yes	47	.10	.31	.247	.805	8.05
	No	299	.12	.46			
Job related demands?	Yes	51	.21	.61	.239	.811	8.11
	No	301	.24	.86			
A bad decision (e.g., go/no go, flight into IMC)?	Yes	49	.61	1.05	2.26	.027	.27
	No	300	.34	.73			
Mechanical problems with the airplane?	Yes	52	.92	1.25	1.71	.088	.88
	No	309	.64	1.04			
Weather problems (e.g., sudden storm)?	Yes	51	.88	1.12	.690	.491	4.91
	No	308	.76	1.11			

Question 3

This question was designed to determine pilots' perception of the aviation system in general, and the FAA in particular. Sixty-seven percent of pilots responded to this question, and the majority provided suggestions for the improvement of the system. One of the most consistent themes among more experienced pilots referred to the level of training provided to pilots. A number of pilots have developed suggestions to improve this situation, including:

> What about incorporating flight training into some sort of adult-ed program or community college level course? The bottom line is better and more complete training at an affordable price [067].
>
> Some IFR training for VFR pilots, as well as stall/spin training [163].
>
> Mandatory hands on spin training from skidding turns and departure stalls prior solo- better basic instruction like "Stick and rudder". Would like to see videos depicting real weather situations from the air which would aid pilot trainee with special recognition of weather systems [233].

Table 21. Flights in potential or actual instrument conditions.

	Damage to an aircraft?	N	Mean	S.D.	t	p	Bonferroni adjusted-p
Flown at night in a single engine aircraft?	Yes	107	2.30	2.15	.183	.855	4.275
	No	614	2.26	2.06			
Flown VFR under a 1500 AGL ceiling?	Yes	103	1.63	1.98	2.474	.014	.07
	No	614	1.17	1.69			
Requested a Special VFR clearance?	Yes	104	.40	1.02	.773	.440	2.2
	No	609	.32	.97			
Flown VFR over the top?	Yes	103	.73	1.34	.417	.677	3.385
	No	610	.67	1.33			
Flown in instrument meteorological conditions?	Yes	106	1.86	2.22	.970	.332	1.66
	No	606	1.65	2.11			

> I think a combination of pilot training and aircraft design is the key to GA safety, NOT more laws and regulations. Of the two, I think pilot training is most important. I think a pilot should receive some kind of safety training at least once a year, possibly twice [247].

Another relatively consistent theme was related to the provision of safety information. It appeared that a significant proportion of pilots could not get access to affordable safety information. Consider:

> Make more safety material available to general aviation. Example: tapes, printed material such as accident reports [234].
>
> I would require the FAA, NTSB, etc. to provide remedial training to help reduce recurrence. (No or low cost). I would have more programs such as "Wings Weekends" available. More safety seminars. Publications such as *Aviation Safety* should be more available and affordable [294].

A number of suggestions were advanced including the use of FBOs, local libraries, or local FSDOs.

A number of pilots considered the overall aviation system to be too complex, and therefore recommended the simplification of both procedures and requirements. For example,

> I would simplify and standardize the FAA regulations [598].
>
> I would simplify communication procedures at major airports. Ground control and approach/departure... more switch and monitor rather than check in [255].
>
> Adopt AOPA 5 point plan on ATC reorganization: simplify recreational pilot certification requirements [266].

Overall, these results initially suggest that the majority of pilots are willing to offer advice concerning the improvement of the aviation system. Moreover, there appears to be a willingness to utilize safety-related information if the information is made accessible. This is consistent with the data arising from the quantitative aspect of the questionnaire, which indicates that pilots generally had a strong inclination towards skills development and the enhancement of pilot safety.

CONCLUSION

Descriptive Analysis

As a means of comparison, it was necessary initially to examine the extent to which the sample data obtained were a valid reflection of the responses that would be expected from the pilot population. In terms of the frequency of responses across pilot categories, the results suggested that commercial pilots and airline transport pilots were overrepresented within the sample, while private pilots were relatively underrepresented relative to the pilot population.

A majority of pilots (59%) in the target group (private certificate holders and non-professional commercial certificate holders) had not attended a FAA-sponsored safety seminar during the preceding 12 months. The attendees and non-attendees differed significantly in their reasons for non-attendance only with respect to "other priorities" that interfered with attendance. In order to encourage future attendance at FAA safety seminars, more consideration should be given to the selection of the topic and providing better meeting locations, as these were the two items chosen most often by seminar attendees and non-attendees, respectively.

Overall, pilots considered a "lecture by experts" as the most preferred learning style, perhaps in combination with slides and videos. However, many pilots are unlikely to have been exposed to all the learning styles listed, and therefore, the responses may reflect "familiarity" rather than "preference" per se.

While there was relatively little difference among the ratings of mean usefulness for each of the topics presented at FAA seminars, "Air Space Classification" was considered the most useful topic, followed closely by "Pilot Decision Making." "Aircraft Systems" was considered the least useful topic. The content of seminars was by far the most important motivator in terms of pilot attendance.

With respect to the venue of FAA-safety seminars, the majority of the pilots expressed a preference for a classroom or FBO meeting room. This appears to reflect the issue of accessibility, which was mentioned previously as one of the strategies to encourage attendance at FAA safety seminars.

Considerable support was expressed for the use of computer technology in safety-related training, with 79% of pilots indicating that they would either certainly or possibly use an interactive computer safety program. Moreover, nearly half of the pilots (45%) indicated a willingness to spend $10 to $30 to purchase a copy of a program.

Comparison of Seminar Attendees and Non-attendees

Those pilots in the target group who had attended at least one FAA-sponsored safety seminar during the previous 12 months differed significantly in four areas from non-attendees in their perceptions regarding FAA seminars. Seminar attendees perceived the FAA seminars as being (1) more interesting, (2) well publicized, and (3) well organized. In addition, they believed more strongly than non-attendees that pilots attend FAA-sponsored to seminars to learn rather than to socialize.

Seminar attendees chose "Offer more exciting presentations" as the best way to encourage attendance. These findings are in accord with other research (Hunter, 1997), which suggests that providing interesting presentations is an important element in attracting pilots to seminars. In contrast, non-attendees indicated that "Provide a better meeting location" was the factor that would most improve their attendance. Both groups agreed, however, on the preferred format – lectures by an expert, combined with a question and answer period.

In examining the factors that may affect attendance decisions, attendees and non-attendees differed only with respect to the extent to which "Other priorities" affected their decision. Non-attendees were more strongly affected by this factor than attendees.

Significant differences were found between the two groups on the incidence of watching safety videos and reading FAA publications. This finding is probably an artifact of the group formation, since many (if not most) FAA seminars involve watching safety videos, and it would not be unreasonable to think that seminar attendees read more FAA publications as a result of their being distributed at all FAA seminars.

Although no significant differences were found between seminar attendees and non-attendees on their self-assessed knowledge and proficiency, it is interesting to note that non-attendees rated themselves as higher on all categories. This leads to the speculation that non-attendees abstain from the FAA safety seminars because they feel, to some extent, that they have achieved a satisfactory state of knowledge and proficiency and, hence, have no need for further training. The present data do not allow us to explore this notion further (specifically, we have no measure of the non-attendees degree of satisfaction with their knowledge and proficiency, relative to attendees), but it would make for an interesting future study.

For those questions that asked the pilots to compare themselves with other pilots, there was only one statistically significant difference. Seminar attendees indicated that they were more willing to study safety, compared to non-attendees. The remainder of the items showed no clear pattern – for half of the items the attendees rated themselves marginally higher than other pilots, while for the other half the non-attendees rated themselves marginally higher than other pilots.

Accident/Incident Involvement and Safety Activities

In comparing the use of safety resources by those pilots who had been in an accident/incident to those pilots who had not been in an accident/incident, only one statistically significant difference was observed. Non-accident pilots hired CFI more often than did accident pilots. A marginally significant difference ($p = .06$) was obtained for "Reading a magazine article on safety" which was done more often by non-accident pilots.

A marginally significant difference ($p = .065$) was also found when comparing accident and non-accident pilots on seminar attendance. Accident pilots were less likely to have attended one or more seminars than non-accident pilots.

Accident pilots consistently rated themselves as higher in knowledge and proficiency than non-accident pilots. In addition, in comparing themselves to other pilots, accident pilots rated themselves as more capable in every category than non-accident pilots.

The proportion of pilots who reported that they had experienced a stressful situation in the previous 12 months was almost exactly the same for accident (43%) and non-accident (44%) pilots. In addition, among those pilots in both groups who reported having experienced a stressful situation, there were no significant differences in the contributing factors for the stressful flights. Similarly there were no significant differences between the two groups with respect to the numbers of times they had flown in potential instrument meteorological conditions. Only one difference, "Flown VFR under a 1500 AGL ceiling" approached significance ($p = .07$).

Qualitative Analysis

A surprising number of respondents took the time to answer the optional questions (76% in the case of the first question). The results arising from the qualitative analysis indicated that the majority of pilots had been involved in stressful situations that caused them to alter their knowledge or attitude about flying. These situations ranged from the pilots being unaware of an impending event until it was too late, to peer or management pressure. A large majority of events was related to weather conditions; in particular, unexpected deterioration from either the forecast on departure or the particular conditions expected.

Overwhelmingly, these events had resulted in pilots becoming more cautious and developing "higher-order" skills such as situation awareness or problem-solving. A number of pilots indicated that they had not received such skills during their training, and that this was one area that required some revision by the FAA. Indeed, requirements for the teaching and evaluation of decision-making have recently been added to the Federal Aviation Regulations.

Consistent with the results arising from the quantitative aspect of the questionnaire, pilots expressed a willingness to improve their safety-related skills but found it difficult to acquire such information. In addition to ease of access, pilots requested a variety of safety-related aids incorporating "real-life scenarios."

Implications

There are several of implications arising from the current analysis that may be used to improve pilots' receptivity to safety-related information.

- Provide FAA seminars in an accessible location (schools, FBOs, etc.)
- Develop and distribute a variety of safety-related training products.
- Ensure that available safety-related training products are cost-effective.
- Define the target group for which a FAA seminar is designed, and focus the seminar accordingly.
- Provide wider publicity for FAA seminars.
- Provide more innovative and interesting topics for discussion at FAA seminars.
- Consider content issues in the selection of seminars (human factors and pilot decision making).
- Develop strategies to encourage the use of safety-related resources among pilots in the target group.

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APPENDIX A

QUESTIONNAIRE

The Ohio State University

DEPARTMENT OF AEROSPACE ENGINEERING, APPLIED MECHANICS, AND AVIATION

AVIATION SAFETY SURVEY

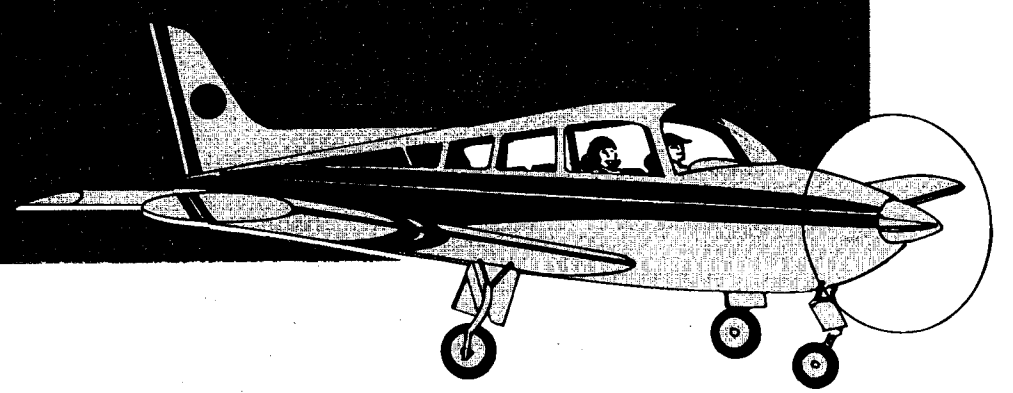
Directions: Please fill in the oval of the best answer or answers to each question completely. Use No. 2 pencil only.

Ex. 1. Have you ever flown as Pilot-In-Command?

● YES NO

Additionally, if you choose the response OTHER as an answer to a question, please elaborate in the space provided. If you are unsure of an answer, such as the exact number of hours you have logged in the past year, use your best estimate, but please answer every question.

The survey should take you about 30 minutes (more if you answer the optional questions at the end) to complete. Thank you for your time and input in this matter.



I. USE OF AVIATION SAFETY INFORMATION:

1. In the last 12 months, how often did you do each of the following?

	0	1	2	3	4	5	6	7	8	9+
Used a computer flight simulation program	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Read a book on aviation safety	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Viewed a video on aviation safety	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Read a magazine article on safety	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Hired a CFI for training	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Read an FAA publication	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Referred to an aircraft operating manual	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Asked another pilot a safety question	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Answered another pilot's safety question	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+
Used a computer-based learning program	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨+

2. The most effective method for me to learn more about each of the following safety topics would be (mark one per topic)...

	Talk to Other Pilots	Attend Safety Seminar	Meet with a CFI	Self Study, Practice	Other, Please Specify
Aerial maneuvers (e.g., stalls)	①	②	③	④	⑤ _____
Airport operating procedures	①	②	③	④	⑤ _____
Air space classifications & use	①	②	③	④	⑤ _____
Air traffic control procedures	①	②	③	④	⑤ _____
Aircraft systems & performance	①	②	③	④	⑤ _____
Emergency procedures	①	②	③	④	⑤ _____
Federal aviation regulations	①	②	③	④	⑤ _____
Flight hazards (e.g., weather)	①	②	③	④	⑤ _____
IFR procedures & techniques	①	②	③	④	⑤ _____
Preflight (e.g., weight & balance)	①	②	③	④	⑤ _____
Takeoff & landing procedures	①	②	③	④	⑤ _____
Pilot decision making	①	②	③	④	⑤ _____
Human factors	①	②	③	④	⑤ _____
Crew resource management	①	②	③	④	⑤ _____

II. SEMINARS:

3. Number of non-FAA safety seminars you have attended in the last 12 months:

- ○ None (go to question 6)
- ○ One
- ○ Two
- ○ Three
- ○ Four or more

4. Who sponsored the last non-FAA safety seminar you attended?

- ○ AOPA
- ○ EAA
- ○ Local FBO
- ○ Other:_____

5. Were the following topics formally presented at the last non-FAA safety seminar you attended?

	YES	NO	If YES, rate its usefulness: Low				High
FAA regulations	Ⓨ	Ⓝ	①	②	③	④	⑤
Takeoffs & landings	Ⓨ	Ⓝ	①	②	③	④	⑤
Operating procedures (IFR or VFR)	Ⓨ	Ⓝ	①	②	③	④	⑤
Air space classifications and use	Ⓨ	Ⓝ	①	②	③	④	⑤
Air traffic control procedures	Ⓨ	Ⓝ	①	②	③	④	⑤
Weather	Ⓨ	Ⓝ	①	②	③	④	⑤
Aircraft systems	Ⓨ	Ⓝ	①	②	③	④	⑤
Pilot decision making	Ⓨ	Ⓝ	①	②	③	④	⑤
Human factors	Ⓨ	Ⓝ	①	②	③	④	⑤

6. Number of FAA safety seminars you have attended in the last 12 months:

- ○ None (go to question 8)
- ○ One
- ○ Two
- ○ Three
- ○ Four or more

7. Were the following topics formally presented at the last FAA safety seminar you attended?

	YES	NO	If YES, rate its usefulness: Low				High
FAA regulations	Ⓨ	Ⓝ	①	②	③	④	⑤
Takeoffs & landings	Ⓨ	Ⓝ	①	②	③	④	⑤
Operating procedures (IFR or VFR)	Ⓨ	Ⓝ	①	②	③	④	⑤
Air space classifications and use	Ⓨ	Ⓝ	①	②	③	④	⑤
Air traffic control procedures	Ⓨ	Ⓝ	①	②	③	④	⑤
Weather	Ⓨ	Ⓝ	①	②	③	④	⑤
Aircraft systems	Ⓨ	Ⓝ	①	②	③	④	⑤
Pilot decision making	Ⓨ	Ⓝ	①	②	③	④	⑤
Human factors	Ⓨ	Ⓝ	①	②	③	④	⑤

8. Regardless of whether you've attended FAA safety seminars, what are your perceptions of <u>each</u> of the following aspects?

FAA seminars primarily are designed for.....	Poor pilots	①	②	③	④	⑤ All pilots
The presentations at FAA seminars are	Boring	①	②	③	④	⑤ Interesting
The topics discussed at FAA seminars are.....	Too complex	①	②	③	④	⑤ Too easy
The material presented at FAA seminars is.....	Repetitive	①	②	③	④	⑤ Innovative
Most pilots go to FAA seminars to	Socialize	①	②	③	④	⑤ Learn
Most FAA seminars are	Poorly publicized	①	②	③	④	⑤ Well publicized
Most FAA seminars are	Poorly organized	①	②	③	④	⑤ Well organized

9. Regardless of whether you've attended <u>non</u>-FAA safety seminars, what are your perceptions of <u>each</u> of the following aspects?

Non-FAA seminars primarily are designed for	Poor pilots	①	②	③	④	⑤ All pilots
The presentations at **non**-FAA seminars are	Boring	①	②	③	④	⑤ Interesting
The topics discussed at **non**-FAA seminars are...	Too complex	①	②	③	④	⑤ Too easy
The material presented at **non**-FAA seminars is...	Repetitive	①	②	③	④	⑤ Innovative
Most pilots go to **non**-FAA seminars to	Socialize	①	②	③	④	⑤ Learn
Most **non**-FAA seminars are	Poorly publicized	①	②	③	④	⑤ Well publicized
Most **non**-FAA seminars are	Poorly organized	①	②	③	④	⑤ Well organized

10. I attended my last safety seminar because (mark ALL that apply)...

- ○ I had never been to one and was curious
- ○ It had been recommended to me by friends
- ○ I wanted to learn about the topic.
- ○ I felt obligated to go
- ○ My friends were going
- ○ I had to renew my certification
- ○ I always try to attend
- ○ Other:_____

11. The BEST way to get me to attend a future aviation safety seminar is...

- ○ Discuss more relevant topics
- ○ Offer more exciting presentations
- ○ Provide a better meeting location
- ○ Set a more convenient meeting time
- ○ Provide child care
- ○ Provide better publicity
- ○ Get more of my friends to attend
- ○ Other:_____
- ○ Do nothing, I will never attend
- ○ Do nothing, I always try to attend

For questions 12 - 17, choose the ONE that best describes the seminar setting that would be <u>MOST</u> appealing to you:

12. Please rate how these factors affect your safety seminar attendance decision.

	Not Important				Very Important
Time	①	②	③	④	⑤
Money	①	②	③	④	⑤
Interest	①	②	③	④	⑤
Motivation	①	②	③	④	⑤
Effort	①	②	③	④	⑤
Other priorities	①	②	③	④	⑤
Confidence	①	②	③	④	⑤
Support from family	①	②	③	④	⑤
Peer pressure	①	②	③	④	⑤
Fear of failure	①	②	③	④	⑤

- ○ Other:_____
- ○ Not applicable, I always try to attend.

13. Meeting Location:

- ○ Airport hangar
- ○ School or college classroom
- ○ FBO/Flying club meeting room
- ○ Friend's house
- ○ Hotel meeting room
- ○ Other:_____

14. Class Size:

- ○ Less than 10
- ○ 10 - 50
- ○ 50 - 100
- ○ More than 100

15. Day:

- ○ Mon.
- ○ Tues.
- ○ Wed.
- ○ Thurs.
- ○ Fri.
- ○ Sat.
- ○ Sun.

16. Time of Day: ○ Morning ○ Afternoon ○ Evening

17. Length:

- ○ Less than 30 minutes
- ○ 30 - 60 minutes
- ○ 60 - 90 minutes
- ○ More than 90 minutes

18. For me, the BEST format for a safety seminar would be (mark only one)...

- ○ Lectures by experts followed by a question and answer period
- ○ Testimonials by fellow pilots followed by a question and answer period
- ○ Open group discussion
- ○ Town meeting format — no set agenda, leader answers questions raised by the group
- ○ Small group discussions on single topic followed by large group discussion
- ○ Video or slide presentation followed by discussion
- ○ Practice exam on topic(s) followed by a question and answer period about exam
- ○ Other:_____

III. COMPUTER/VIDEO USE:

19. Do you use a computer at home?

○ YES ○ NO

20. Have you used a computer flight simulation program?

○ YES ○ NO

21. Is it likely you will buy a computer for your home in the next year?

○ YES ○ NO

22. If the FAA provided interactive computer safety programs for pilots, would you use them?

○ Certainly ○ Not likely
○ Possibly ○ Never (go to question 25)
○ Uncertain

23. If the FAA prepared computer safety programs for pilots, what is the most you would be willing to pay to buy one?

○ Will not use ○ $10 to $30
○ $0 ○ $31 to $100
○ Less than $10 ○ More than $100

24. If the FAA prepared computer safety programs for pilot use, what is the best way to make them available to you?

○ Will not use
○ Down load from a network (E-Mail, etc.)
○ Buy at a computer store
○ Order through the mail
○ Buy at a FBO

25. Which of the following describes your computer equipment set-up and format? (mark ALL that apply)

○ MAC ○ Diskette
○ IBM ○ E-Mail
○ CD-ROM ○ I have no computer

26. Have you ever viewed an aviation safety video at home?

○ YES ○ NO

27. If the FAA prepared aviation safety videos for pilots, would you view them?

○ Certainly ○ Not likely
○ Possibly ○ Never (go to question 31)
○ Uncertain

28. If the FAA prepared aviation safety videos for pilots, which of the following is the best way to make them available to you?

○ Local FSDO ○ Grocery store
○ Local library ○ Other:_____
○ Video rental store

29. If the FAA prepared aviation safety videos for pilots, what is the most you would be willing to pay to BUY one?

○ Will not use ○ $5 to $10
○ $0 ○ More than $10
○ Less than $5

30. If the FAA prepared aviation safety videos for pilots, what is the most you would be willing to pay to RENT one?

○ Will not use ○ $3 to $5
○ $0 ○ More than $5
○ Less than $3

IV. SELF ASSESSMENT:

31. Please rate your level of knowledge or proficiency as a pilot in each of the following areas...

	Poor				Excellent
Preflight planning	1	2	3	4	5
Ground handling	1	2	3	4	5
Takeoff and landing procedures	1	2	3	4	5
Basic VFR flying techniques	1	2	3	4	5
Instrument flying procedures	1	2	3	4	5
Emergency procedures	1	2	3	4	5
Weather and its impact on flight	1	2	3	4	5
Air traffic control procedures	1	2	3	4	5
Navigation	1	2	3	4	5
Aviator decision making	1	2	3	4	5
Human factors	1	2	3	4	5
Air space regulations	1	2	3	4	5

32. Compared to other pilots...

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am more safety conscious	1	2	3	4	5
I am more willing to study safety	1	2	3	4	5
I do better on FAA written exams	1	2	3	4	5
I do better on FAA check rides	1	2	3	4	5
I am willing to do more to be a safe pilot	1	2	3	4	5
I have had fewer "close calls"	1	2	3	4	5
I know more about the causes of accidents	1	2	3	4	5
I am more interested in safety issues	1	2	3	4	5
I take fewer risks when flying	1	2	3	4	5

33. Approximately how much of the information required for safe flight do you think you...

	None	Very Little	About Half	Most	Almost All
Learned at a safety seminar	①	②	③	④	⑤
Learned from a textbook	①	②	③	④	⑤
Learned from watching videos	①	②	③	④	⑤
Learned from a CFI	①	②	③	④	⑤
Memorized but never understood	①	②	③	④	⑤
Learned from a computerized tutorial	①	②	③	④	⑤
Learned in a classroom	①	②	③	④	⑤

V. STRESS FACTORS:

We are attempting to determine the frequency with which pilots encounter situations they perceive as dangerous, or situations that are stressful because they are unusual or potentially dangerous. When answering questions 35 - 38, a* stressful situation *is defined as a flight where you were the Pilot-In-Command and either of the following occurred: (1) a situation you feared might result in injury or damage; or (2) a situation where something happened causing above normal stress to you, your passengers or others.

34. In the last 12 months...

- ○ I have had a stressful situation as defined above.
- ○ I have not had a stressful situation as defined above (go to question 37).

35. How many of your flights in the last 12 months as Pilot-In-Command put you in a stressful situation (as defined above)?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9+

36. How often were the following contributing factors in your stressful flights in the last 12 months...

Fuel problems?	⓪	①	②	③	④	5+
Mistakes made by pilots in other aircraft?	⓪	①	②	③	④	5+
Navigational problems?	⓪	①	②	③	④	5+
Physiological problems (e.g., illness, fatigue)?	⓪	①	②	③	④	5+
Family commitments?	⓪	①	②	③	④	5+
Passenger requirements?	⓪	①	②	③	④	5+
Job related demands?	⓪	①	②	③	④	5+
A bad decision (e.g., go/no go, flight into IMC)?	⓪	①	②	③	④	5+
Mechanical problems with the airplane?	⓪	①	②	③	④	5+
Weather problems (e.g., sudden storm)?	⓪	①	②	③	④	5+
Other: _____	⓪	①	②	③	④	5+

37. Have you been the Pilot-In-Command of an aircraft that was involved in an accident or incident resulting in...

	YES	NO
Damage to an aircraft?	Ⓨ	Ⓝ
Damage to property?	Ⓨ	Ⓝ
Personal injury?	Ⓨ	Ⓝ

VI. RECENT FLYING EXPERIENCE:

38. About how many hours have you logged as Pilot-In-Command in...

	Last 12 months			Career		
	Under 25	25-50	Over 50	Under 100	100-400	Over 400
Airplane	○	○	○	○	○	○
Night	○	○	○	○	○	○
Simulator	○	○	○	○	○	○
Actual instrument	○	○	○	○	○	○
Complex single engine	○	○	○	○	○	○
Multi-engine piston	○	○	○	○	○	○
Turbine	○	○	○	○	○	○

39. Have you ever flown as Pilot-In-Command as a...

	YES	NO
Military pilot?	Ⓨ	Ⓝ
Commercial pilot for hire (e.g., air taxi, CFI)?	Ⓨ	Ⓝ
Airline Pilot?	Ⓨ	Ⓝ

40. Which category and class represents the type of flying you have done *most frequently* in the last 12 months?

Category: ○ Airplane ○ Rotorcraft ○ Lighter-than-air ○ Glider

Class: ○ Single-Engine Land ○ Multi-Engine Land ○ Single-Engine Sea ○ Multi-Engine Sea ○ Helicopter ○ Gyroplane ○ Airship ○ Balloon

○ I have NOT flown in the past 12 months (go to question 43).

41. What portion of your total hours logged in the past 12 months were...

	Zero	Less than 25%	25% to 50%	50% to 75%	75% to 100%
Local VFR pleasure flights	○	○	○	○	○
Cross-country VFR pleasure flights	○	○	○	○	○
Cross-country VFR business flights	○	○	○	○	○
Training or proficiency flights	○	○	○	○	○
IFR flights for business purposes	○	○	○	○	○
IFR flights for personal purposes	○	○	○	○	○
Commercial flight crew member	○	○	○	○	○
Other, please specify: _____	○	○	○	○	○

42. In the past 12 months, how many times have you...

Flown at night in a single engine aircraft?	⓪	①	②	③	④	⑤+
Flown VFR under a 1500 AGL ceiling?	⓪	①	②	③	④	⑤+
Requested a Special VFR clearance?	⓪	①	②	③	④	⑤+
Flown VFR over the top?	⓪	①	②	③	④	⑤+
Flown in instrument meteorological conditions?	⓪	①	②	③	④	⑤+

VII. PERSONAL INFORMATION:

43. Where did you receive the MAJORITY of training for your first pilot certificate (please mark ONLY ONE of the following)...

○ Military flying school
○ Civilian flying school
○ Collegiate flight school
○ None of the above, please specify: _____
○ From a CFI working for a Fixed-Based Operator
○ From a CFI working for a flying club
○ From a CFI working independently

44. Indicate the year you received each Certificate and Rating you hold:

STUDENT: 19____

	Recreational	Private	Commercial	Airline Transport	CFI	Instrument
AIRPLANE:						19____
single-engine land	19____	19____	19____	19____	19____	
multi-engine land		19____	19____	19____	19____	
single-engine sea	19____	19____	19____	19____		
multiengined sea		19____	19____	19____		
ROTORCRAFT:				19____		
helicopter	19____	19____	19____		19____	19____
gyroplane	19____	19____	19____		19____	
LIGHTER-THAN-AIR:						
airship		19____	19____			
free balloon		19____	19____			
GLIDER:		19____	19____		19____	

ENTER RATINGS OR LETTERS OF AUTHORIZATION: _____

45. To what flying organizations do you belong? (mark ALL that apply)

- ○ Aircraft Owners & Pilots Association (AOPA)
- ○ Experimental Aircraft Association (EAA)
- ○ Vocation related organizations (e.g., Flying Farmers)
- ○ Aircraft owner's club (e.g., Cessna Pilot's Assoc.)
- ○ Aviation trade organization (e.g., union)
- ○ Ninety-nines
- ○ A flying club
- ○ Other: _____
- ○ I do not belong to a flying organization.

46. What flying magazines do you read regularly? (mark ALL that apply)

- ○ FAA Aviation Safety Journal
- ○ AOPA Pilot
- ○ Flying
- ○ Air Progress
- ○ Aviation Safety
- ○ Aviation Consumer
- ○ EAA Sport Aviation
- ○ Business & Commercial Aviation
- ○ Plane & Pilot
- ○ Professional Pilot
- ○ Others:_____
- ○ I do not read flying magazines.

47. Highest educational degree received:

- ○ Grade School
- ○ High School
- ○ Associates degree or equivalent (2 yrs. college)
- ○ College Graduate (B.A., B.S., or other Bachelors degree)
- ○ Master's Degree
- ○ Professional or Academic Doctorate (M.D., J.D., Ph.D., etc.)

48. Year of Birth: 19 ⓪⓪ ①① ②② ③③ ④④ ⑤⑤ ⑥⑥ ⑦⑦ ⑧⑧ ⑨⑨

49. In which region do you usually take-off from?

- ○ Alaska
- ○ Central (IA, KS, MO, NE)
- ○ Eastern (DC, DE, MD, NJ, NY, PA, VA, WV)
- ○ Great Lakes (IL, IN, MI, MN, ND, OH, SD, WI)
- ○ New England (CT, MA, ME, NH, RI, VT)
- ○ Northwest - Mountain (CO, ID, MT, OR, WA, WY, UT)
- ○ Southern (AL, FL, GA, KY, MS, NC, SC, TN)
- ○ Southwestern (AR, LA, NM, OK, TX)
- ○ Western Pacific (AZ, CA, HI, NV)

50. What is your primary occupation: _____

51. Gender: ○ Male ○ Female

Thank you for taking the time to thoroughly complete this survey. It is concerned individuals, such as yourself, who participate in research studies that help make positive changes in the aviation field possible.

Furthermore, as mentioned in the survey cover letter, there are four optional questions on the following page. Feel no obligation to complete them, but please do so if you feel you have something to offer that you believe would be helpful to this research project or aviation safety in general. Thank you again for your assistance in this important study.

AVIATION SAFETY SURVEY OPTIONAL QUESTIONS:

1. Over your career, have you had flying experiences (accidents, incidents, or stressful situations) that have changed your knowledge or attitude about flying in a significant way? Such experiences may be useful in teaching other pilots better decision making skills. Please use the space below, adding other pages as needed, to describe one such experience.

2. Some say that experiences such as you just described can make you less safe because you were rewarded by "making it through". Others say, that the pain of the experience makes you more cautious. What was the result of the above experience to you? Did it make you more cautious? Did it make you believe that because you were successful, you could take more chances?

3. If you were in a position of power, what would you change to make your kind of aviation safer in the USA?

4. If any of the questions in the survey sparked an idea potentially useful for aviation safety, please use the space below, and/or additional pages, to discuss or expand on your answers.

APPENDIX B

DISTRIBUTIONS OF RESPONSE FREQUENCIES FOR CERTIFICATE CATEGORIES AND TARGET GROUP

TABLE B-1.

In the last 12 months, how often:

Used a computer flight simulation program

	Target	Private	Commercial	ATP
Never	61%	61%	58%	53%
One time	6%	7%	8%	9%
Two times	6%	5%	7%	12%
Three times	4%	4%	4%	5%
Four times	2%	3%	3%	4%
Five times	4%	3%	4%	3%
Six times	4%	4%	3%	2%
Seven times	1%	1%	1%	1%
Eight times	0%	0%	1%	0%
Nine or more times	13%	13%	12%	12%

Read a book on aviation safety

Never	32%	32%	30%	40%
One time	19%	20%	17%	16%
Two times	14%	15%	13%	12%
Three times	8%	8%	9%	6%
Four times	4%	4%	6%	4%
Five times	5%	6%	7%	4%
Six times	4%	4%	3%	3%
Seven times	1%	1%	1%	1%
Eight times	0%	1%	1%	1%
Nine or more times	12%	11%	14%	13%

Viewed a video on aviation safety

Never	41%	42%	35%	24%
One time	19%	20%	17%	16%
Two times	15%	14%	16%	21%
Three times	8%	8%	11%	12%
Four times	6%	6%	6%	9%
Five times	3%	3%	6%	7%
Six times	2%	2%	2%	5%
Seven times	1%	1%	0%	0%
Eight times	1%	1%	1%	1%
Nine or more times	5%	5%	6%	7%

Read a magazine article on safety

Target	Private	Commercial	ATP	
Never	4%	4%	3%	3%
One time	4%	4%	2%	4%
Two times	6%	6%	6%	7%
Three times	7%	6%	6%	7%
Four times	6%	6%	5%	7%
Five times	7%	6%	8%	8%
Six times	6%	7%	8%	7%
Seven times	4%	4%	3%	3%
Eight times	4%	4%	4%	4%
Nine or more times	54%	53%	56%	50%

Hired a CFI for training

Never	31%	30%	43%	76%
One time	23%	25%	21%	11%
Two times	14%	13%	13%	7%
Three times	7%	7%	6%	1%
Four times	4%	4%	3%	0%
Five times	3%	2%	2%	1%
Six times	2%	2%	2%	0%
Seven times	1%	1%	0%	0%
Eight times	1%	1%	0%	0%
Nine or more times	14%	14%	10%	2%

Read an FAA publication

Never	11%	11%	6%	10%
One time	9%	10%	5%	8%
Two times	14%	13%	11%	14%
Three times	12%	13%	8%	8%
Four times	13%	14%	11%	9%
Five times	10%	9%	9%	10%
Six times	8%	8%	9%	8%
Seven times	2%	2%	4%	2%
Eight times	1%	1%	2%	1%
Nine or more times	22%	19%	36%	30%

Referred to an aircraft operating manual

Target	Private	Commercial	ATP	
Never	9%	10%	6%	3%
One time	8%	9%	5%	2%
Two times	11%	13%	9%	3%
Three times	11%	11%	7%	4%
Four times	10%	10%	8%	3%
Five times	8%	8%	7%	5%
Six times	9%	8%	8%	5%
Seven times	2%	2%	3%	2%
Eight times	2%	1%	2%	2%
Nine or more times	31%	27%	47%	72%

Asked another pilot a safety question

Never	20%	21%	17%	9%
One time	9%	10%	8%	5%
Two times	17%	17%	13%	11%
Three times	10%	10%	9%	7%
Four times	7%	7%	6%	8%
Five times	9%	9%	9%	11%
Six times	5%	5%	6%	8%
Seven times	2%	2%	3%	2%
Eight times	2%	2%	2%	1%
Nine or more times	19%	17%	29%	38%

Answered another pilot's safety question

Never	33%	37%	15%	8%
One time	9%	11%	5%	5%
Two times	13%	13%	10%	9%
Three times	9%	9%	9%	6%
Four times	9%	7%	9%	7%
Five times	8%	8%	8%	8%
Six times	4%	4%	6%	7%
Seven times	1%	2%	2%	3%
Eight times	1%	1%	1%	2%
Nine or more times	12%	9%	34%	46%

Used a computer-based learning program

Never	74%	74%	69%	52%
One time	7%	6%	9%	12%
Two times	4%	4%	6%	13%
Three times	4%	4%	4%	4%
Four times	2%	2%	3%	3%
Five times	2%	1%	2%	4%
Six times	1%	1%	2%	2%
Seven times	1%	1%	0%	1%
Eight times	1%	1%	0%	0%
Nine or more times	6%	6%	6%	10%

TABLE B-2.

The most effective method for me to learn would be:

Aerial maneuvers (e.g., stalls)

	Target	Private	Commercial	ATP
Talk to other pilots	5%	4%	7%	12%
Attend safety seminar	4%	4%	4%	4%
Meet with a CFI	55%	58%	47%	29%
Self-study, practice	32%	31%	37%	39%
Other	3%	3%	5%	17%

Airport operating procedures

Talk to other pilots	19%	18%	19%	23%
Attend safety seminar	23%	23%	24%	19%
Meet with a CFI	24%	24%	20%	8%
Self-study, practice	31%	32%	34%	41%
Other	4%	4%	4%	10%

Airspace classification and use

Talk to other pilots	3%	4%	3%	5%
Attend safety seminar	31%	30%	32%	27%
Meet with a CFI	19%	19%	17%	8%
Self-study, practice	44%	43%	45%	52%
Other	4%	4%	4%	9%

Air traffic control procedures

Talk to other pilots	7%	7%	7%	9%
Attend safety seminar	29%	29%	29%	31%
Meet with a CFI	26%	27%	22%	8%
Self-study, practice	45%	33%	37%	42%
Other	4%	4%	5%	10%

Aircraft systems and performance

Talk to other pilots	12%	12%	10%	5%
Attend safety seminar	7%	7%	7%	7%
Meet with a CFI	21%	22%	18%	8%
Self-study, practice	57%	55%	58%	60%
Other	4%	4%	7%	20%

Emergency procedures

Talk to other pilots	4%	4%	4%	4%
Attend safety seminar	12%	12%	9%	8%
Meet with a CFI	46%	50%	36%	16%
Self-study, practice	34%	30%	45%	52%
Other	4%	4%	6%	20%

Federal Aviation Regulations

	Target	Private	Commercial	ATP
Talk to other pilots	2%	1%	2%	3%
Attend safety seminar	30%	31%	26%	22%
Meet with a CFI	14%	15%	11%	5%
Self-study, practice	51%	49%	57%	60%
Other	3%	4%	4%	10%

Flight hazards (e.g., weather)

Talk to other pilots	10%	10%	11%	14%
Attend safety seminar	39%	38%	37%	34%
Meet with a CFI	15%	17%	12%	3%
Self-study, practice	31%	30%	38%	47%
Other	5%	5%	3%	12%

IFR procedures and techniques

Talk to other pilots	5%	4%	6%	11%
Attend safety seminar	8%	8%	13%	17%
Meet with a CFI	63%	65%	50%	19%
Self-study, practice	20%	18%	29%	42%
Other	5%	5%	3%	11%

Preflight (e.g., weight and balance)

Talk to other pilots	4%	4%	3%	7%
Attend safety seminar	3%	3%	5%	9%
Meet with a CFI	21%	22%	21%	18%
Self-study, practice	69%	68%	69%	55%
Other	3%	3%	2%	11%

Take off and landing procedures

Talk to other pilots	5%	5%	5%	10%
Attend safety seminar	3%	4%	2%	4%
Meet with a CFI	45%	45%	43%	25%
Self-study, practice	44%	43%	46%	46%
Other	3%	3%	3%	15%

Pilot decision making

Talk to other pilots	17%	16%	18%	31%
Attend safety seminar	28%	28%	30%	27%
Meet with a CFI	18%	20%	13%	7%
Self-study, practice	35%	33%	37%	26%
Other	3%	3%	3%	10%

Human factors

	Target	Private	Commercial	ATP
Talk to other pilots	18%	17%	15%	18%
Attend safety seminar	41%	39%	48%	50%
Meet with a CFI	9%	11%	6%	3%
Self-study, practice	29%	30%	28%	18%
Other	3%	3%	4%	11%

Crew resource management

Talk to other pilots	20%	21%	17%	15%
Attend safety seminar	38%	36%	46%	51%
Meet with a CFI	13%	14%	9%	5%
Self-study, practice	23%	24%	23%	13%
Other	6%	6%	6%	17%

TABLE B-3.

Non-FAA Safety seminars.

Number of non-FAA seminars attended in last 12 months

Target	Private	Commercial	ATP
None	62%	65%	54%	47%
One	18%	17%	22%	24%
Two	10%	9%	13%	18%
Three	4%	4%	4%	3%
Four or more	6%	6%	8%	7%

Sponsor of last non-FAA seminar attended

AOPA	24%	27%	27%	11%
EAA	11%	13%	7%	3%
Local FBO	22%	24%	18%	7%
Other	42%	36%	48%	79%

TABLE B-4.

Topics covered at non-FAA seminars and their usefulness.

FAA regulations

	Target	Private	Commercial	ATP
Yes**	24%	23%	32%	41%
If Yes, then usefulness:	(N=192)	(N=139)	(N=170)	N=244)
1 - [Low]	3%	5%	1%	5%
2 -	10%	9%	13%	12%
3 -	40%	36%	36%	30%
4 -	25%	27%	22%	23%
5 -[High]	22%	24%	29%	31%

** Figure given is percentage of sample responding yes to this question. Remaining percentages of usefulness are based upon those who responded YES (i.e., N=192 for the Target group).

Take-off and landing

	Target	Private	Commercial	ATP
Yes	14%	13%	21%	30%
If Yes, then usefulness:	(N=112)	(N=80)	(N=113)	(N=179)
1 - [Low]	2%	3%	4%	5%
2 -	13%	14%	11%	12%
3 -	32%	31%	34%	28%
4 -	25%	20%	25%	22%
5 -[High]	29%	33%	27%	34%

Operating procedures (IFR or VFR)

Yes	24%	22%	33%	42%
If Yes, then usefulness:	(N=188)	(N=130)	(N=179)	(N=246)
1 - [Low]	2%	2%	2%	2%
2 -	12%	14%	8%	7%
3 -	31%	30%	35%	34%
4 -	27%	27%	28%	27%
5 -[High]	28%	27%	27%	31%

Airspace classification and use

Yes	24%	23%	29%	31%
If Yes, then usefulness:	(N=188)	(N=138)	(N=155)	(N=183)
1 - [Low]	2%	3%	0%	5%
2 -	7%	6%	6%	12%
3 -	21%	20%	22%	25%
4 -	39%	43%	32%	29%
5 -[High]	31%	28%	40%	30%

Air traffic control procedures

Yes	19%	17%	28%	33%
If Yes, then usefulness:	(N=154)	(N=110)	(N=150)	(N=193)
1 - [Low]	3%	4%	1%	5%
2 -	12%	11%	11%	10%
3 -	35%	32%	37%	30%
4 -	29%	31%	24%	27%
5 -[High]	21%	21%	27%	28%

Weather

Yes	24%	21%	30%	38%
If Yes, then usefulness:	(N=189)	(N=127)	(N=159)	(N=225)
1 - [Low]	3%	4%	3%	4%
2 -	8%	11%	6%	8%
3 -	30%	28%	28%	31%
4 -	25%	24%	28%	26%
5 -[High]	34%	33%	35%	31%

Aircraft systems

	Target	Private	Commercial	ATP
Yes	13%	12%	20%	37%
If Yes, then usefulness:	(N=102)	(N=72)	(N=110)	(N=221)
1 - [Low]	4%	4%	3%	3%
2 -	14%	15%	9%	2%
3 -	20%	18%	28%	16%
4 -	25%	26%	23%	27%
5 -[High]	37%	37%	37%	52%

Pilot decision making

Yes	25%	22%	35%	44%
If Yes, then usefulness:	(N=196)	(N=130)	(N=187)	(N=263)
1 - [Low]	3%	5%	1%	3%
2 -	10%	13%	9%	6%
3 -	19%	22%	24%	24%
4 -	32%	26%	31%	27%
5 -[High]	35%	34%	35%	41%

Human factors

Yes	20%	17%	31%	45%
If Yes, then usefulness:	(N=160)	(N=100)	(N=165)	(N=267)
1 - [Low]	3%	4%	1%	3%
2 -	12%	16%	9%	8%
3 -	23%	27%	26%	24%
4 -	24%	17%	29%	26%
5 -[High]	36%	32%	35%	39%

TABLE B-5.

FAA Safety seminars.

Number of FAA seminars attended in last 12 months

None	59%	57%	62%	81%
One	21%	21%	20%	10%
Two	12%	14%	12%	6%
Three	6%	6%	4%	1%
Four or more	2%	2%	3%	1%

TABLE B-6.

Topics covered at FAA seminars and their usefulness.

FAA regulations

	Target	Private	Commercial	ATP
Yes	28%	28%	29%	13%
If Yes, then usefulness:	(N=222)	(N=170)	(N=154)	(N=76)
1 - [Low]	3%	4%	3%	9%
2 -	9%	7%	16%	16%
3 -	37%	39%	25%	32%
4 -	31%	30%	31%	21%
5 -[High]	20%	21%	25%	22%

Take-off and landings

Yes	13%	14%	12%	6%
If Yes, then usefulness:	(N=102)	(N=83)	(N=67)	(N=34)
1 - [Low]	6%	6%	8%	15%
2 -	12%	10%	13%	24%
3 -	32%	34%	31%	29%
4 -	28%	30%	25%	18%
5 -[High]	23%	22%	22%	15%

Operating procedures (IFR and VFR)

Yes	22%	22%	25%	12%
If Yes, then usefulness:	(N=178)	(N=130)	(N=135)	(N=72)
1 - [Low]	2%	1%	2%	10%
2 -	5%	2%	10%	8%
3 -	37%	39%	37%	32%
4 -	32%	31%	29%	31%
5 -[High]	26%	26%	23%	19%

Airspace classification and use

Yes	28%	30%	27%	13%
If Yes, then usefulness:	(N=222)	(N=178)	(N=145)	(N=76)
1 - [Low]	3%	3%	6%	9%
2 -	8%	8%	7%	11%
3 -	26%	27%	21%	25%
4 -	32%	33%	34%	22%
5 -[High]	31%	29%	33%	33%

Air traffic control procedures

Yes	22%	23%	22%	10%
If Yes, then usefulness:	(N=175)	(N=137)	(N=120)	(N=62)
1 - [Low]	3%	3%	3%	10%
2 -	7%	7%	9%	8%
3 -	34%	35%	26%	32%
4 -	31%	30%	33%	21%
5 -[High]	26%	26%	28%	29%

Weather

	Target	Private	Commercial	ATP
Yes	23%	23%	23%	9%
If Yes, then usefulness:	(N=179)	(N=141)	(N=123)	(N=51)
1 - [Low]	5%	5%	2%	8%
2 -	6%	6%	15%	16%
3 -	31%	32%	27%	37%
4 -	31%	29%	32%	14%
5 -[High]	28%	28%	24%	26%

Aircraft systems

Yes	8%	9%	9%	4%
If Yes, then usefulness:	(N=61)	(N=52)	(N=47)	(N=25)
1 - [Low]	10%	12%	9%	8%
2 -	12%	10%	13%	8%
3 -	36%	39%	26%	20%
4 -	25%	23%	28%	20%
5 -[High]	18%	17%	26%	44%

Pilot decision making

Yes	23%	23%	25%	10%
If Yes, then usefulness:	(N=184)	(N=138)	(N=132)	(N=62)
1 - [Low]	2%	2%	2%	3%
2 -	6%	7%	8%	13%
3 -	30%	31%	30%	29%
4 -	36%	35%	30%	29%
5 -[High]	26%	25%	30%	26%

Human factors

Yes	20%	21%	19%	11%
If Yes, then usefulness:	(N=162)	(N=128)	(N=104)	(N=67)
1 - [Low]	3%	3%	5%	8%
2 -	9%	9%	11%	12%
3 -	30%	28%	34%	28%
4 -	31%	33%	26%	22%
5 -[High]	28%	27%	25%	30%

TABLE B-7.

Perceptions of FAA seminars.

Seminars primarily designed for

	Target	Private	Commercial	ATP
1 - [Poor pilots]	1%	1%	2%	2%
2 -	2%	2%	4%	7%
3 -	13%	12%	16%	28%
4 -	14%	13%	15%	15%
5 - [All pilots]	70%	73%	63%	48%

Presentations were

	Target	Private	Commercial	ATP
1 - [Boring]	4%	3%	5%	8%
2 -	9%	9%	12%	18%
3 -	37%	37%	39%	45%
4 -	30%	28%	29%	19%
5 - [Interesting]	21%	23%	16%	11%

Topics discussed are

1 - [Too complex]	2%	2%	2%	2%
2 -	6%	6%	6%	3%
3 -	72%	73%	67%	63%
4 -	15%	15%	19%	23%
5 - [Too easy]	5%	4%	6%	9%

Material presented is

1 - [Repetitive]	8%	9%	11%	13%
2 -	20%	19%	25%	30%
3 -	50%	50%	45%	48%
4 -	16%	17%	15%	9%
5 - [Innovative]	6%	6%	4%	1%

Most pilots go to seminars to

1 - [Socialize]	3%	3%	4%	6%
2 -	7%	7%	10%	12%
3 -	25%	25%	25%	30%
4 -	35%	35%	33%	34%
5 - [Learn]	31%	29%	28%	18%

Most seminars are

1 - [Poorly publicized]	10%	10%	7%	8%
2 -	15%	13%	17%	16%
3 -	23%	23%	26%	32%
4 -	25%	25%	25%	28%
5 - [Well publicized]	28%	29%	26%	17%

Most seminars are

1 - [Poorly organized]	4%	4%	3%	4%
2 -	7%	6%	6%	7%
3 -	32%	32%	33%	48%
4 -	30%	29%	34%	30%
5 - [Well organized]	28%	29%	24%	11%

TABLE B-8.

Perceptions of non-FAA seminars.

	Target	Private	Commercial	ATP
Seminars primarily designed for				
1 - [Poor pilots]	1%	1%	1%	1%
2 -	3%	3%	4%	6%
3 -	20%	19%	23%	27%
4 -	20%	19%	20%	18%
5 - [All pilots]	56%	58%	53%	48%
Presentations were				
1 - [Boring]	2%	2%	1%	3%
2 -	4%	4%	6%	8%
3 -	40%	39%	37%	40%
4 -	36%	36%	36%	34%
5 - [Interesting]	19%	19%	19%	16%
Topics discussed are				
1 - [Too complex]	1%	1%	1%	0%
2 -	6%	6%	5%	6%
3 -	74%	74%	76%	75%
4 -	15%	15%	14%	16%
5 - [Too easy]	3%	3%	4%	2%
Material presented is				
1 - [Repetitive]	4%	5%	4%	6%
2 -	13%	14%	13%	14%
3 -	56%	54%	54%	51%
4 -	21%	21%	23%	22%
5 - [Innovative]	6%	6%	7%	7%
Most pilots go to seminars to				
1 - [Socialize]	5%	6%	4%	5%
2 -	14%	14%	14%	10%
3 -	30%	29%	30%	32%
4 -	27%	27%	28%	29%
5 - [Learn]	24%	23%	26%	25%
Most seminars are				
1 - [Poorly publicized]	15%	17%	11%	12%
2 -	23%	23%	22%	20%
3 -	33%	32%	33%	35%
4 -	19%	18%	20%	21%
5 - [Well publicized]	10%	10%	14%	13%

Most seminars are

	Target	Private	Commercial	ATP
1 - [Poorly organized]	3%	4%	2%	2%
2 -	9%	10%	8%	6%
3 -	43%	43%	39%	42%
4 -	29%	29%	32%	32%
5 - [Well organized]	15%	15%	19%	18%

TABLE B-9.

Reasons for attending last seminar.

	Target	Private	Commercial	ATP
Never been to one; curious	12%	12%	9%	5%
Friend's recommendation	11%	11%	9%	4%
Wanted to learn about topic	61%	58%	57%	34%
Obligated to go	7%	7%	7%	9%
Friends were going	7%	7%	8%	3%
Had to renew my certification	5%	5%	14%	23%
Always try to attend	27%	26%	23%	11%
Other	15%	14%	16%	30%

Note: Multiple responses allowed; therefore columns will not sum to 100%

TABLE B-10.

Best way to encourage future attendance.

	Target	Private	Commercial	ATP
Discuss more relevant topics	12%	11%	17%	24%
Offer more exciting presentations	12%	11%	15%	14%
Provide better meeting location	19%	20%	14%	10%
Set more convenient meeting time	9%	11%	6%	5%
Provide child care	1%	1%	1%	1%
Provide better publicity	14%	13%	11%	9%
Get more of my friends to attend	1%	1%	0%	0%
Other	5%	5%	10%	12%
Do nothing, I will never attend	3%	3%	4%	13%
Do nothing, I always try to attend	25%	26%	23%	13%

TABLE B-11.

Importance of factors in attendance decision.

Time

	Target	Private	Commercial	ATP
1 - [Not important]	6%	6%	6%	4%
2 -	4%	4%	4%	4%
3 -	13%	13%	17%	13%
4 -	27%	26%	24%	22%
5 - [Very important]	51%	51%	49%	58%

Money

	Target	Private	Commercial	ATP
1 - [Not important]	28%	27%	26%	20%
2 -	14%	13%	13%	14%
3 -	26%	26%	24%	26%
4 -	18%	18%	26%	19%
5 - [Very important]	15%	15%	22%	22%

Interest

1 - [Not important]	2%	2%	2%	1%
2 -	1%	1%	1%	1%
3 -	12%	12%	13%	12%
4 -	37%	37%	32%	32%
5 - [Very important]	49%	48%	52%	54%

Motivation

1 - [Not important]	5%	5%	4%	3%
2 -	4%	4%	5%	4%
3 -	25%	25%	27%	24%
4 -	36%	37%	33v	36%
5 - [Very important]	30%	29%	31%	33%

Effort

1 - [Not important]	6%	6%	6%	5%
2 -	9%	9%	9%	5%
3 -	37%	37%	41%	38%
4 -	28%	29%	26%	36%
5 - [Very important]	20%	19%	18%	15%

Other priorities

1 - [Not important]	8%	8%	8%	8%
2 -	7%	8%	6%	11%
3 -	33%	32%	35%	34%
4 -	27%	28%	26%	23%
5 - [Very important]	25%	24%	26%	25%

Confidence

1 - [Not important]	22%	24%	25%	29%
2 -	14%	12%	11%	12%
3 -	31%	31%	33%	32%
4 -	21%	20%	19%	18%
5 - [Very important]	12%	12%	11%	9%

Support from family

1 - [Not important]	46%	46%	49%	48%
2 -	19%	18%	19%	16%
3 -	20%	21%	18%	23%
4 -	7%	7%	7%	10%
5 - [Very important]	8%	8%	7%	4%

Peer pressure

	Target	Private	Commercial	ATP
1 - [Not important]	67%	67%	71%	69%
2 -	15%	15%	16%	14%
3 -	13%	13%	12%	14%
4 -	4%	4%	2%	2%
5 - [Very important]	1%	1%	0%	1%

Fear of failure

1 - [Not important]	70%	69%	77%	78%
2 -	14%	14%	12%	10%
3 -	12%	12%	9%	9%
4 -	3%	3%	2%	2%
5 - [Very important]	1%	2%	0%	1%

TABLE B-12.

Preferences for seminar venue and scheduling.

Meeting location

	Target	Private	Commercial	ATP
Airport hangar	21%	22%	16%	11%
School or college classroom	27%	27%	30%	31%
FBO/Flying club meeting room	33%	33%	30%	22%
Friend's house	0%	0%	0%	1%
Hotel meeting room	13%	13%	18%	27%
Other	6%	6%	5%	9%

Class size

Less than 10	7%	7%	7%	11%
10 - 50	76%	75%	74%	72%
50 - 100	15%	15%	15%	14%
More than 100	3%	3%	4%	3%

Day

Monday	10%	9%	9%	15%
Tuesday	16%	18%	12%	14%
Wednesday	24%	24%	23%	23%
Thursday	13%	12%	15%	11%
Friday	7%	5%	9%	4%
Saturday	27%	27%	27%	31%
Sunday	5%	5%	6%	3%

Time of day

Morning	19%	19%	23%	38%
Afternoon	11%	11%	11%	15%
Evening	70%	70%	66%	47%

Length of meeting

	Target	Private	Commercial	ATP
Less than 30 minutes	1%	1%	1%	1%
30 - 60 minutes	22%	21%	21%	18%
60 - 90 minutes	61%	61%	63%	57%
More than 90 minutes	17%	17%	15%	25%

Preferred format

Lectures by experts & question and answer period	54%	53%	59%	61%
Testimonials by fellow pilots & question and answer period	6%	7%	6%	7%
Open group discussion	2%	3%	2%	4%
Town meeting format — no set agenda, leader answers questions raised by group	1%	1%	1%	3%
Small group discussion on single topic followed by large group discussion	3%	2%	2%	3%
Video or slide presentation followed by discussion	29%	29%	27%	20%
Practice exam on topic(s) followed by a question and answer period about exam	3%	3%	2%	0%
Other	3%	3%	2%	3%

TABLE B-13.

Computer ownership and usage.

	Target	Private	Commercial	ATP
Use a computer at home – Yes	71%	71%	65%	73%
Have used a computer flight simulation program - Yes	55%	55%	60%	59%
Is it likely you will buy a computer for your home in the next year - Yes	36%	38%	34%	37%

Would you use FAA computer safety programs

Certainly	41%	40%	42%	28%
Possibly	38%	40%	33%	43%
Uncertain	8%	8%	8%	9%
Not likely	10%	9%	13%	15%
Never	4%	4%	4%	6%

What is the most you would pay for FAA computer safety programs

Will not use	7%	6%	8%	11%
$0	10%	10%	12%	16%
Less than $10	21%	21%	20%	25%
$10 to $30	45%	46%	43%	39%
$31 to $100	16%	16%	15%	9%
More than $100	1%	1%	1%	1%

What is the best way for you to obtain FAA computer safety programs

	Target	Private	Commercial	ATP
Will not use	8%	6%	9%	12%
Down load from a network	22%	21%	24%	30%
Buy at a computer store	3%	3%	4%	4%
Order through the mail	47%	49%	44%	42%
Buy at a FBO	20%	21%	19%	12%

Describe your computer equipment

MAC	11%	11%	10%	12%
IBM	60%	59%	56%	59%
CD-ROM	31%	32%	28%	31%
Diskette	46%	46%	42%	40%
E-Mail	23%	22%	25%	26%
I have no computer	22%	21%	26%	22%

Note: Multiple responses permitted; therefore, columns will not sum to 100%

TABLE B-14.
Video use.

Q26. Have you viewed aviation safety video at home

	Target	Private	Commercial	ATP
— Yes	60%	62%	62%	42%

Would you view FAA aviation safety videos

Certainly	53%	54%	53%	34%
Possible	40%	39%	39%	48%
Uncertain	4%	4%	3%	6%
Not likely	3%	3%	4%	9%
Never	1%	1%	1%	4%

What is the best way for you to obtain FAA aviation safety videos

Local FSDO	21%	20%	25%	19%
Local library	34%	33%	34%	35%
Video rental store	24%	25%	24%	25%
Grocery store	3%	3%	2%	3%
Other	19%	19%	16%	18%

What is the most you would pay to buy a FAA safety video

Will not use	2%	2%	3%	7%
$0	11%	11%	12%	21%
Less than $5	13%	13%	13%	15%
$5 to $10	50%	50%	52%	43%
More than $10	25%	25%	20%	15%

What is the most you would pay to rent a FAA safety video

	Target	Private	Commercial	ATP
Will not use	2%	1%	3%	5%
$0	7%	6%	10%	16%
Less than $3	50%	50%	50%	48%
$3 to $5	38%	39%	35%	30%
More than $5	3%	3%	3%	2%

TABLE B-15.
Self-assessment.

Preflight planning

	Target	Private	Commercial	ATP
1 - [Poor]	0%	0%	0%	0%
2 -	2%	2%	1%	1%
3 -	21%	24%	12%	8%
4 -	49%	49%	42%	30%
5 - [Excellent]	28%	25%	45%	62%

Ground handling

1 - [Poor]	0%	0%	0%	0%
2 -	1%	1%	1%	1%
3 -	20%	23%	9%	7%
4 -	48%	48%	41%	32%
5 - [Excellent]	31%	28%	49%	60%

Take off and landing procedures

1 - [Poor]	0%	0%	0%	0%
2 -	2%	2%	1%	0%
3 -	23%	26%	8%	4%
4 -	5%	51%	42%	27%
5 - [Excellent]	26%	21%	50%	69%

Basic VFR flying techniques

1 - [Poor]	0%	1%	0%	1%
2 -	1%	1%	0%	5%
3 -	17%	18%	10%	20%
4 -	52%	56%	37%	27%
5 - [Excellent]	30%	25%	53%	47%

Instrument flying procedures

1 - [Poor]	22%	27%	5%	0%
2 -	25%	28%	13%	1%
3 -	25%	22%	28%	7%
4 -	21%	17%	34%	27%
5 - [Excellent]	8%	5%	20%	65%

Emergency procedures

	Target	Private	Commercial	ATP
1 - [Poor]	1%	1%	1%	0%
2 -	13%	15%	6%	1%
3 -	46%	49%	29%	9%
4 -	30%	29%	41%	34%
5 - [Excellent]	9%	7%	24%	56%

Weather and its impact on flight

1 - [Poor]	1%	1%	1%	0%
2 -	8%	8%	4%	0%
3 -	33%	37%	22%	10%
4 -	39%	37%	43%	34%
5 - [Excellent]	19%	17%	30%	56%

Air traffic control procedures

1 - [Poor]	1%	2%	1%	0%
2 -	13%	15%	6%	1%
3 -	34%	36%	21%	10%
4 -	38%	36%	46%	36%
5 - [Excellent]	13%	11%	27%	53%

Navigation

1 - [Poor]	0%	0%	0%	0%
2 -	2%	2%	1%	0%
3 -	32%	24%	12%	4%
4 -	46%	48%	38%	30%
5 - [Excellent]	31%	27%	49%	66%

Aviator decision making

1 - [Poor]	0%	0%	0%	0%
2 -	3%	3%	1%	0%
3 -	26%	27%	15%	6%
4 -	50%	53%	45%	30%
5 - [Excellent]	21%	17%	39%	64%

Human factors

1 - [Poor]	1%	1%	1%	0%
2 -	5%	5%	3%	1%
3 -	36%	37%	25%	11%
4 -	42%	43%	44%	42%
5 - [Excellent]	16%	14%	27%	46%

Air space regulations

1 - [Poor]	2%	2%	2%	1%
2 -	16%	17%	9%	6%
3 -	43%	44%	31%	28%
4 -	33%	32%	41%	34%
5 - [Excellent]	6%	5%	18%	31%

TABLE B-16.

Comparison to other pilots.

I am more safety conscious

	Target	Private	Commercial	ATP
1 - [Strongly disagree]	0%	0%	0%	0%
2 - [Disagree]	1%	1%	2%	1%
3 - [Neutral]	33%	34%	23%	25%
4 - [Agree]	48%	48%	49%	47%
5 - [Strongly Agree]	17%	17%	27%	27%

I am more willing to study safety

1 - [Strongly disagree]	0%	0%	0%	0%
2 - [Disagree]	3%	3%	3%	4%
3 - [Neutral]	37%	36%	30%	35%
4 - [Agree]	47%	49%	46%	46%
5 - [Strongly Agree]	13%	12%	21%	16%

I do better on FAA written exams

1 - [Strongly disagree]	0%	1%	0%	1%
2 - [Disagree]	9%	9%	7%	4%
3 - [Neutral]	50%	51%	41%	47%
4 - [Agree]	30%	28%	34%	34%
5 - [Strongly Agree]	11%	11%	17%	15%

I do better on FAA check rides

1 - [Strongly disagree]	1%	1%	0%	1%
2 - [Disagree]	7%	8%	6%	3%
3 - [Neutral]	64%	66%	47%	44%
4 - [Agree]	24%	22%	34%	38%
5 - [Strongly Agree]	5%	4%	12%	15%

I am willing to do more to be a safe pilot

1 - [Strongly disagree]	0%	0%	0%	0%
2 - [Disagree]	1%	1%	0%	0%
3 - [Neutral]	21%	21%	15%	21%
4 - [Agree]	55%	55%	52%	49%
5 - [Strongly Agree]	23%	22%	32%	30%

I have fewer "close calls"

1 - [Strongly disagree]	1%	1%	1%	1%
2 - [Disagree]	5%	5%	7%	6%
3 - [Neutral]	39%	39%	36%	36%
4 - [Agree]	37%	37%	36%	36%
5 - [Strongly Agree]	17%	18%	21%	21%

I know more about the causes of accidents

	Target	Private	Commercial	ATP
1 - [Strongly disagree]	1%	1%	0%	0%
2 - [Disagree]	8%	9%	5%	4%
3 - [Neutral]	49%	51%	39%	39%
4 - [Agree]	32%	30%	39%	38%
5 - [Strongly Agree]	10%	9%	17%	19%

I am more interested in safety issues

1 - [Strongly disagree]	1%	1%	1%	0%
2 - [Disagree]	3%	2%	2%	3%
3 - [Neutral]	41%	43%	34%	34%
4 - [Agree]	42%	43%	41%	44%
5 - [Strongly Agree]	14%	12%	22%	20%

I take fewer risks when flying

1 - [Strongly disagree]	0%	1%	0%	1%
2 - [Disagree]	2%	2%	3%	1%
3 - [Neutral]	24%	23%	21%	22%
4 - [Agree]	45%	47%	44%	38%
5 - [Strongly Agree]	28%	28%	32%	38%

TABLE B-17.

How much of the information required for safe flight did you think you:

I learned at a safety seminar

	Target	Private	Commercial	ATP
1 - [None]	16%	18%	12%	17%
2 - [Very little]	47%	46%	50%	53%
3 - [About half]	29%	29%	30%	22%
4 - [Most]	7%	6%	6%	7%
5 - [Almost all]	1%	1%	2%	1%

I learned from a textbook

1 - [None]	1%	1%	0%	2%
2 - [Very little]	22%	20%	22%	22%
3 - [About half]	42%	44%	42%	44%
4 - [Most]	30%	31%	30%	28%
5 - [Almost all]	5%	5%	7%	5%

I learned from watching videos

1 - [None]	175	17%	16%	12%
2 - [Very little]	46%	44%	55%	54%
3 - [About half]	25%	26%	22%	24%
4 - [Most]	10%	12%	6%	8%
5 - [Almost all]	2%	2%	1%	2%

Learned from a CFI

	Target	Private	Commercial	ATP
1 - [None]	1%	1%	2%	12%
2 - [Very little]	8%	7%	11%	27%
3 - [About half]	32%	32%	33%	31%
4 - [Most]	44%	44%	43%	25%
5 - [Almost all]	15%	16%	12%	5%

Memorized but never understood

1 - [None]	35%	34%	41%	43%
2 - [Very little]	51%	50%	48%	50%
3 - [About half]	11%	12%	9%	5%
4 - [Most]	3%	4%	2%	1%
5 - [Almost all]	0%	0%	0%	0%

I learned from a computerized tutorial

1 - [None]	71%	71%	70%	53%
2 - [Very little]	21%	20%	25%	36%
3 - [About half]	5%	6%	5%	9%
4 - [Most]	3%	3%	1%	2%
5 - [Almost all]	0%	0%	0%	0%

Learned in a classroom

1 - [None]	14%	17%	7%	1%
2 - [Very little]	32%	34%	30%	15%
3 - [About half]	31%	31%	35%	40%
4 - [Most]	17%	14%	21%	31%
5 - [Almost all]	6%	5%	7%	13%

TABLE B-18.
Stress Factors.

I was in a stressful situation in last 12 months

	Target	Private	Commercial	ATP
Yes	46%	47%	47%	55%

Number of flights during last 12 months that put you in a stressful situation

1	21%	22%	18%	17%
2	14%	13%	15%	14%
3	5%	5%	6%	7%
4	3%	3%	3%	5%
5	1%	1%	1%	3%
6	1%	1%	1%	2%
7	0%	0%	1%	1%
8	1%	0	0	1%
9 or more	1%	1%	3%	6%

How often were these contributing factors in your stressful flights in the last 12 months.
(Percentages based upon respondents to Question 35 – "Have you had a stressful event in previous 12 months." Approximate N= 350, 280, 250, and 350, for Target, Private, Commercial, & Airline Transport, respectively)

Fuel problems

	Target	Private	Commercial	ATP
0	86%	88%	80%	77%
1	10%	9%	14%	17%
2	2%	2%	2%	4%
3	1%	0%	2%	1%
4	1%	1%	2%	1%
5 or more	0%	0%	1%	1%

Mistakes made by pilots in other aircraft

0	69%	69%	61%	60%
1	17%	17%	22%	19%
2	7%	8%	7%	11%
3	3%	3%	4%	4%
4	2%	2%	4%	4%
5 or more	2%	2%	3%	3%

Navigational problems

0	82%	81%	84%	83%
1	14%	14%	12%	10%
2	2%	3%	1%	4%
3	1%	1%	1%	1%
4	0%	0%	0%	1%
5 or more	0%	0%	1%	1%

Physiological problems (e.g., illness, fatigue)

0	88%	89%	82%	63%
1	7%	6%	9%	15%
2	3%	3%	4%	7%
3	1%	0%	2%	5%
4	0%	0%	1%	4%
5 or more	1%	1%	3%	7%

Family commitments

0	93%	92%	92%	85%
1	6%	7%	4%	6%
2	1%	0%	2%	6%
3	1%	0%	2%	1%
4	0%	0%	0%	1%
5 or more	0%	0%	0%	1%

Passenger requirements

	Target	Private	Commercial	ATP
0	91%	91%	86%	71%
1	8%	7%	9%	14%
2	1%	1%	2%	6%
3	0%	0%	1%	3%
4	0%	0%	1%	3%
5 or more	0%	0%	1%	3%

Job related demands

0	89%	90%	78%	58%
1	5%	4%	9%	14%
2	3%	3%	3%	7%
3	1%	1%	3%	7%
4	1%	1%	1%	6%
5 or more	1%	1%	7%	9%

A bad decision (e.g., go/no-go, flight into IMC)

0	74%	76%	74%	79%
1	18%	17%	18%	13%
2	4%	4%	6%	3%
3	2%	2%	3%	2%
4	1%	1%	0%	1%
5 or more	1%	1%	1%	1%

Mechanical problems with the airplane

0	57%	57%	56%	41%
1	30%	31%	27%	33%
2	7%	4%	9%	12%
3	2%	1%	3%	6%
4	2%	2%	2%	4%
5 or more	3%	3%	2%	4%

Weather problems (e.g., sudden storm)

0	51%	54%	45%	37%
1	34%	33%	32%	33%
2	8%	6%	12%	10%
3	3%	3%	4%	9%
4	1%	1%	3%	3%
5 or more	3%	3%	5%	8%

TABLE B-19.
Accident involvement.

I have been the pilot-in-command of an aircraft involved in an accident or incident resulting in:

	Target	Private	Commercial	ATP
Damage to an aircraft – YES	15%	13%	20%	18%
Damage to property - YES	2%	2%	2%	2%
Personal injury - YES	2%	1%	2%	2%

TABLE B-20.
Flying Experience.

Hours logged as pilot-in-command – Airplane

	Target	Private	Commercial	ATP	
Last 12 months					
Under 25	32%	33%	28%	20%	
25 to 50	29%	31%	19%	5%	
Over 50	39%	36%	54%	75%	
Career					
Under 100	7%	9%	1%	0%	
100 to 400	39%	47%	12%	1%	
Over 400	53%	44%	87%	99%	

Hours logged as pilot-in-command – Night

Last 12 months				
Under 25	88%	89%	75%	34%
25 to 50	7%	6%	13%	14%
Over 50	5%	5%	12%	52%
Career				
Under 100	65%	73%	34%	1%
100 to 400	22%	18%	37%	11%
Over 400	13%	9%	29%	88%

Hours logged as pilot-in-command – Simulator

Last 12 months				
Under 25	93%	94%	91%	74%
25 to 50	5%	4%	7%	13%
Over 50	2%	2%	3%	12%
Career				
Under 100	82%	88%	73%	19%
100 to 400	13%	9%	19%	37%
Over 400	5%	3%	8%	44%

Hours logged as pilot-in-command – Actual Instrument

	Target	Private	Commercial	ATP
Last 12 months				
Under 25	89%	91%	78%	39%
25 to 50	7%	6%	14%	23%
Over 50	4%	3%	8%	39%
Career				
Under 100	75%	82%	52%	3%
100 to 400	18%	16%	39%	17%
Over 400	8%	3%	18%	80%

Hours logged as pilot-in-command – Complex single-engine

Last 12 months				
Under 25	70%	73%	57%	79%
25 to 50	13%	14%	15%	4%
Over 50	17%	14%	28%	17%
Career				
Under 100	57%	66%	28%	21%
100 to 400	19%	16%	30%	22%
Over 400	24%	19%	42%	58%

Hours logged as pilot-in-command – multi-engine piston

Last 12 months				
Under 25	93%	95%	80%	78%
25 to 50	3%	2%	9%	4%
Over 50	4%	3%	11%	18%
Career				
Under 100	85%	90%	60%	27%
100 to 400	5%	4%	17%	15%
Over 400	10%	6%	23%	58%

Hours logged as pilot-in-command – Turbine

Last 12 months				
Under 25	92%	95%	85%	31%
25 to 50	1%	1%	2%	3%
Over 50	7%	5%	13%	66%
Career				
Under 100	83%	90%	71%	8%
100 to 400	1%	1%	4%	3%
Over 400	16%	10%	25%	89%

TABLE B-21.
Military flying experience.

I have flown as pilot-in-command as a:

	Target	Private	Commercial	ATP
Military pilot – YES	13%	7%	23%	51%
Commercial pilot for hire – YES	4% *	5%*	63%	73%
Airline pilot – YES	1% *	1%*	4%	62%

*These entries are probably erroneous, since the holder of a Private certificate could not serve as a commercial crew member. However, it is possible that an individual previously held a higher level certificate and surrendered it.

TABLE B-22.
Characteristics of aircraft most frequently flown.

Aircraft flown most frequently in last 12 months

	Target	Private	Commercial	ATP
Category				
Airplane	96%	97%	94%	98%
Rotorcraft	6%	3%	5%	2%
Lighter-than-air	0%	0%	0%	0%
Glider	1%	1%	0%	0%
Class				
Single-engine land	88%	90%	76%	13%
Multi-engine land	9%	7%	18%	85%
Single-engine sea	1%	1%	1%	1%
Multi-engine sea	0%	0%	0%	0%
Helicopter	2%	2%	5%	1%
Gyroplane	0%	0%	0%	0%
Airship	0%	0%	0%	0%
Balloon	0%	0%	0%	0%

TABLE B-23.
Portion of total hours logged during the last 12 months.

Local VFR pleasure flights

	Target	Private	Commercial	ATP
Zero	10%	9%	18%	61%
Less than 25%	38%	36%	50%	33%
25% to 50%	18%	19%	14%	3%
50% to 75%	16%	17%	11%	2%
75% to 100%	17%	19%	9%	2%

Cross-country VFR pleasure flights

	Target	Private	Commercial	ATP
Zero	18%	16%	26%	71%
Less than 25%	33%	33%	42%	25%
25% to 50%	28%	30%	18%	3%
50% to 75%	14%	15%	9%	1%
75% to 100%	7%	7%	5%	1%

Cross-country VFR business flights

Zero	65%	64%	55%	79%
Less than 25%	18%	19%	21%	14%
25% to 50%	9%	10%	11%	2%
50% to 75%	4%	4%	7%	1%
75% to 100%	4%	4%	7%	4%

Training or proficiency flights

Zero	12%	13%	10%	21%
Less than 25%	55%	55%	54%	64%
25% to 50%	15%	16%	15%	8%
50% to 75%	8%	9%	9%	2%
75% to 100%	9%	7%	13%	6%

IFR flights for business purposes

Zero	81%	83%	64%	51%
Less than 25%	9%	8%	15%	8%
25% to 50%	5%	5%	9%	4%
50% to 75%	2%	1%	4%	5%
75% to 100%	3%	3%	8%	32%

IFR flights for personal purposes

Zero	70%	76%	57%	81%
Less than 25%	19%	15%	32%	16%
25% to 50%	7%	7%	7%	2%
50% to 75%	2%	2%	2%	1%
75% to 100%	2%	1%	2%	0%

Commercial flight crew member

Zero	95%	95%	74%	19%
Less than 25%	1%	1%	6%	2%
25% to 50%	0%	0%	3%	1%
50% to 75%	0%	0%	3%	3%
75% to 100%	4%	3%	14%	75%

Other (N approximately 169 to 246)

Zero	89%	90%	67%	62%
Less than 25%	3%	3%	5%	8%
25% to 50%	1%	1%	5%	5%
50% to 75%	2%	2%	7%	3%
75% to 100%	5%	3%	17%	21%

TABLE B-24.

In the past 12 months, how many times have you...

Flown at night in a single-engine aircraft

	Target	Private	Commercial	ATP
Zero	35%	37%	29%	71%
1	8%	7%	8%	6%
2	12%	11%	9%	4%
3	10%	11%	8%	3%
4	8%	8%	7%	2%
5 or more	27%	26%	39%	14%

Flown VFR under a 1500 AGL ceiling

Zero	55%	57%	47%	70%
1	14%	13%	12%	6%
2	11%	11%	9%	5%
3	5%	5%	5%	3%
4	2%	2%	3%	1%
5 or more	13%	11%	23%	16%

Requested a Special VFR clearance

Zero	84%	86%	75%	84%
1	9%	8%	10%	5%
2	2%	2%	6%	4%
3	2%	1%	3%	2%
4	1%	1%	1%	2%
5 or more	2%	2%	5%	4%

Flown VFR over the top

Zero	72%	73%	62%	80%
1	10%	11%	9%	5%
2	9%	9%	8%	5%
3	4%	3%	5%	2%
4	2%	2%	2%	1%
5 or more	5%	3%	14%	8%

Flown in instrument meteorological conditions

Zero	55%	63%	31%	6%
1	8%	7%	7%	2%
2	5%	5%	7%	2%
3	4%	3%	6%	2%
4	3%	3%	4%	1%
5 or more	25%	19%	46%	87%

TABLE B-25.
Source of initial flight training.

Where did you receive the majority of training for your first pilot certificate

	Target	Private	Commercial	ATP
Military flying school	11%	6%	17%	36%
Civilian flying school	16%	16%	19%	19%
Collegiate flight school	6%	5%	10%	11%
CFI at a FBO	42%	46%	33%	19%
CFI at a flying club	9%	10%	8%	6%
Independent CFI	15%	17%	12%	8%
Other	0%	0%	20%	1%

TABLE B-26.
Membership in flying organizations.

Belong to flying organizations

	Target	Private	Commercial	ATP
AOPA	70%	70%	66%	31%
EAA	22%	21%	21%	13%
Vocation	1%	1%	2%	2%
Aircraft owner's club	14%	12%	15%	7%
Aviation trade organization	1%	0%	3%	31%
Ninety-nines	2%	2%	3%	1%
A flying club	19%	17%	20%	6%
Other	10%	9%	15%	20%

TABLE B-27.
Use of aviation-related periodicals.

Flying magazines read regularly

	Target	Private	Commercial	ATP
FAA Aviation Safety	16%	16%	20%	14%
AOPA Pilot	73%	74%	72%	38%
Flying	44%	44%	47%	31%
Air Progress	5%	5%	4%	5%
Aviation Safety	22%	22%	24%	17%
Aviation Consumer	8%	8%	6%	5%
EAA Sport Aviation	21%	20%	20%	12%
Business & Commercial Aviation	5%	7%	13%	30%
Plane & Pilot	30%	34%	22%	7%
Professional Pilot	3%	3%	12%	38%
Other	22%	20%	29%	39%

TABLE B-28.
Education.

Highest education level completed

	Target	Private	Commercial	ATP
Grade school	1%	1%	1%	0%
High school 21%	22%	15%	9%	
Associate degree (2 years' college)	16%	17%	20%	19%
College graduate (B.A., B.S.)	35%	34%	41%	55%
Master's degree	18%	17%	17%	17%
Professional or academic doctorate (M.D., J.D., Ph.D.)	10%	10%	7%	1%

TABLE B-29.
Departure point for flights.

Region you usually take-off from

	Target	Private	Commercial	ATP
Alaska	3%	3%	3%	1%
Central	6%	6%	7%	3%
Eastern	14%	13%	15%	16%
Great Lakes	22%	22%	17%	17%
New England	6%	5%	5%	3%
Northwest-Mountain	11%	12%	7%	9%
Southern	13%	12%	18%	17%
Southwestern	12%	12%	14%	15%
Western Pacific	15%	15%	15%	19%

TABLE B-30.
Gender.

Gender

	Target	Private	Commercial	ATP
Male	94%	93%	94%	96%
Female	6%	7%	6%	4%