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16. Abstract

Recent ATC attrition rates showed no sex differences in the proportion of trainees who completed FAA Academy training; however, the percentage of females who subsequently left ATC work was over twice that of male trainees. In the present study, the 56 females who entered the Academy between December 1968 and November 1970, and who were no longer with the FAA as of June 1972, were matched on several variables with male attritions who had entered the Academy at the same time. Reasons for attrition were obtained from job-exit forms, telephone interviews, and a questionnaire. More than 80 per cent of trainee attritions could be accounted for by four reasons: training, family, other employment, and perceived discrimination on the job. Reasons for attrition given at the time of job-exit which cited another job or "personal" matters lacked statistical reliability during the follow-ups; reasons relating to family matters were comparatively stable. Reasons concerning perceived inadequate training and job discrimination were absent in job-exit data but were mentioned occasionally in the follow-ups. In telephone interviews, 18 per cent of the females (and no males) mentioned sex discrimination as a reason for attrition. However, some type of discrimination (e.g., age, race, sex, background, personality) was alleged by 22 per cent of females and 13.4 per cent of males; this difference was not statistically significant. The category which accounted for most of the difference in attrition rates between the sexes was family-related attrition cited by about one-third of the females. This finding agrees with results of other studies of different occupational groups. Of the attrited females and males, 88 per cent and 92 per cent, respectively, indicated that they would again consider FAA employment.

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A SEX COMPARISON OF REASONS FOR ATTRITION OF NON-JOURNEYMAN FAA AIR TRAFFIC CONTROLLERS

I. Introduction.

The problem of employee turnover, particularly in the critical career position of Air Traffic Control Specialists (ATCSs), is an important concern of the Federal Aviation Administration. The ATC occupation comprises about 25,000 specialists, or nearly one-half of all FAA personnel (FAA Fact Card, 1972). While the annual attrition rate of all FAA control personnel has been approximately 5 per cent over the last five years, recent FAA Office of Manpower reports[3] indicate that about 24 per cent of the personnel recruited for ATC training during a recent period were attrited within two years after being hired (i.e., before they could reach journeyman status). This "trainee" attrition rate of 12 per cent annually as compared to the overall rate of 5 per cent per year emphasizes that ATC losses are predominantly among those controllers who are still learning to do the job.

Much of the trainee attrition noted above resulted from failure to pass two months of initial training courses conducted at the FAA Academy. Many of the subsequent trainee attritions (i.e., from among those who graduated from the Academy) "washed out" during additional training at the facilities to which they were assigned, but a substantial number of them left due to reasons which, although specified more exactly on their official resignation forms (Civil Service Commission Standard Form 52 or SF-52), were classified as "personal" on personnel records maintained by FAA Headquarters. Moreover, a recent study[1] presenting ATC trainee attrition rates indicated that while no sex differences existed in the percentage of trainees completing Academy training during 1968–1970, the proportion of women who left ATC work before 1972, less than three years after completing initial training, was over twice that of men (48 per cent of a sample of 66 female Academy graduates compared to 22 per cent of 613 male graduates).

One basis for the higher attrition rate for female controllers might be the fact that air traffic control is a predominantly male occupation (97 per cent of ATCSs are men). Some other predominantly male occupations have experienced higher attrition rates for women. Dropout percentages twice that for males have been reported for female medical students[5] and psychology graduate students.[7] Also, resignations of British women police have been about double that of policemen.[12]

However, the traditional sex role of the male as the main income provider and the biological role of the female in childbirth and care also influence the work tenure and work preferences of women. For example, if the husband of a working woman takes a job in another location, she will usually quit her job and move with him. These and other female role conflicts have received considerable discussion.[6 13 14] Even for the single woman, especially if young, occupation is often a secondary role (see Kuhlen and Johnson[8]) as she may aspire to get married and quit work. As alluded to above,[9] age can interact with marital status to affect turnover. Young married women may work primarily for economic reasons. Older women seem more likely to remain on the job whether single[15] or married.[4] If single, older women are unlikely to marry[8] and are more career-oriented; if married, older women have fewer problems with children (who also tend to be older) and are less likely to relocate. Similarly, due to family responsibilities, turnover is often less for married than for single males.[2 15 16]

One way of attempting to reduce turnover is to examine reasons behind resignations for possible corrective action by management. The purpose of this study is to assess the impact of

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"resignations for personal reasons" on turnover of new ATCSs in general and, specifically, to compare the reasons given by males and by females for leaving ATC work. This sex comparison will provide FAA management with information relevant to equal employment opportunity goals which in addition to remaining an administrative commitment have now become the law of the land with the Equal Employment Opportunity Act of 1972 (Public Law 92–261) which President Nixon signed on March 24, 1972. In this study, reasons for resignation stated by the subjects at the time of resignation on official Standard Forms 52 (SF–52) are compared to reasons given to researchers via telephone interviews and mail questionnaires. Previous research[10 11] has revealed substantial differences between reasons stated at the time of resignation and those elicited from former employees several months later. In addition to investigating the reliability of such information, the data from these two sources are analyzed for possible sex differences in causes for terminating ATC work.

II. Method.

A. *Subjects.* Of the 119 females who entered initial ATC training at the FAA Academy from December 1968 to November 1970 (there were over 4,600 male entrants), 56 had left work by June 1972; all of these female attritions were included in the study. The subjects were classified into two groups depending on whether they had completed Academy training but left ATC work, or had failed to pass Academy training and consequently left the field. Each female was matched with an attrited male who had entered the FAA Academy during the same time period; thus, although all females for whom appropriate data were available were included in the study, only a small percentage of the much larger population of male trainees was represented. In addition, each male was chosen to match a female counterpart as closely as possible with respect to age, type of training option (En Route, Terminal, or Flight Service), size and geographical location of facility of assignment, possession of previous certified ATC experience (usually from military service), date of entry into ATC Academy training, and duration of employment. The purpose of this matching was to eliminate differences between sex groups in those factors which might be related to performance and/or tenure. Job-level and salary, which in other occupations often co-vary with sex and are reported to be related to turnover, were also controlled. Since all subjects were ATCSs, job-level was constant and, due to the matching on type of ATC work and date of employment, pay rates were the same.

B. *Procedure.* Biographical data concerning the subjects and their work setting were obtained from several sources with overlapping data providing checks on the accuracy of the information. First, each subject completed a "personal background and data sheet" upon entry into Academy training, providing information such as birthdate, education, previous ATC experience, date of employment, type of training option, and the facility for which recruited. FAA Headquarters' personnel tape records of all ATCSs were utilized to determine whether a subject was still in ATC work as of June 30, 1972, and to verify type and facility of assignment. Monthly personnel tapes were then used to obtain dates of separation of those ATCSs no longer with the FAA and the coded "official" reason for the personnel loss (such as resignation, "personal," separation for cause, or death). Data from SF–52's concerning reasons for and dates of resignation were obtained, if the forms were available, from personnel records at the Federal Civilian Records Center in St. Louis.

Attritions were contacted by telephone and given a semi-structured interview (Appendix A). They were asked their primary and secondary (if any) reasons for leaving ATC work, their present marital status and number of children, if they were currently working or in school, and if they would consider returning to the FAA and ATC work. They were then asked if they might be sent a questionnaire about some aspects of the ATC job. The questionnaire comprised six sections, five of which were included for purposes other than those of the present study and will not be discussed here; those five measured a variety of attitudinal, motivational, and evaluative factors. The sixth section of the questionnaire, Section F (Appendix B), consisted of a list of 20 possible reasons for leaving ATC work with space provided beside many items for giving more detail or for writing in examples. The directions instructed each attrition to rank up to four reasons, in order of importants, which contributed toward a decision to leave FAA-ATC work.

C. *Categorization of Reasons for Leaving ATC Work.* Reasons for leaving ATC work, as specified in each of the several sources used to obtain data in this study, were categorized using the alternatives listed in Section F of the mail questionnaire. On the basis of trends in responses, a few alternatives from Section F were further divided, several were grouped, and the few which elicited no responses were eliminated. For the telephone interviews, three raters including one of the authors (JJM) separately categorized the reasons for attrition, noting a main reason and, if given, one to three secondary reasons. If two or all three of the raters agreed, that reason became the consensus, and in the few cases in which all raters disagreed, the consensus reason was chosen by one of the authors (JJM). Among the three raters, inter-rater agreement averaged 81 per cent for the male interviews and 78 per cent for the female interviews. The job-exit (SF–52) and follow-up sources of reason for leaving ATC work were inspected for consistency and chi square analyses were used to detect any sex differences in frequencies within categories.

D. *Response Rate.* Fifty of 56 female attritions and 52 of the 56 matched male attritions were interviewed by telephone. Three females and three males could not be reached by telephone and three females and one male attrition declined to be interviewed. Completed or partly completed questionnaires were returned by 40 of the female attritions and 52 of the male attritions. The relatively high percentage of questionnaires returned was achieved, at least partially, through use of air mail letters and follow-up reminders by telephone. This high return rate eliminates most of any possible self-selection bias in the final sample. However, there was a tendency for fewer Academy attri-

TABLE 1

Attrition during Academy training: Main reasons for leaving FAA-ATC work as stated by 13 female and 15 male trainees in 1972 telephone interviews. All entered FAA Academy training during 1969-1970.

	Females		Males	
	N	%	N	%
1. Training failure or difficulty				
A. Did not meet training standards or lacked aptitude for ATC	4	30.8	5	33.3
B. Inadequate training	3	23.1	5	33.3
C. Too old	1	7.7	1	6.7
D. Outside distractions (personal problems)	2	15.4	0	0.0
E. Discrimination by instructors due to				
1. Sex	1	7.7	0	0.0
2. Age	0	0.0	1	6.7
3. Pilot background	1	7.7	2	13.3
2. General discrimination by student peers				
A. Sex	1	7.7	0	0.0
B. Personality	0	0.0	0	0.0
3. Pressure, responsibility	0	0.0	1	6.7
Total	13		15	

tions to respond to the questionnaire. Three of the four males and eight of the 16 females from whom no completed attrition questionnaire was received had been terminated during Academy training. These 11 represented 29 per cent of the Academy attritions. Still, the percentages of Academy attritions out of the total group of attritions who returned questionnaires were similar for both sexes, 27 per cent and 23 per cent for male and female attritions, respectively.

E. *Demographic Characteristics of Samples.* As a result of the matching technique, the sex groups were quite comparable in background characteristics. The mean ages in years and standard deviations (SD) for males and females were 29.6 and 6.1, and 30.0 and 7.5, respectively. Two or more years of college education were possessed by 46.4 per cent of the males and 41.1 per cent of the females. Previous ATC certificates (usually from military experience) were helcd by 26.7 per cent of the males and 21.4 per cent of the females. The length of FAA-ATC tenure in months was also similar for the males (mean=12.3, SD=10.3) and females (mean=12.0, SD=9.9).

III. Results and Discussion.

A. *Job-Exit Reasons for Attrition.* A completed Standard Form 52 (or SF–50 which was sometimes used in lieu of SF–52) was obtained from the Civilian Records Center for 29 female and 37 male former ATC trainees. Most of the reasons given upon leaving ATC work could be

TABLE 2

Attrition during facility training: Main reasons for leaving FAA-ATC work as stated by 37 female and 37 male trainees in 1972 telephone interviews. All entered FAA Academy training during 1969-1970.

	Females		Males	
	N	%	N	%
1. Training failure or difficulty				
A. Did not meet training standards, lacked aptitude for ATC	3	8.1	6	16.2
B. Inadequate training	0	0.0	3	8.1
C. Too old	0	0.0	0	0.0
D. Outside distractions (personal problems)	1	2.7	1	2.7
E. Discrimination by instructors due to				
1. Sex	2	5.4	0	0.0
2. Age	1	2.7	1	2.7
3. Pilot background	0	0.0	0	0.0
4. Race	0	0.0	1	2.7
5. Lack of ATC related experience	0	0.0	1	2.7
Total 1	7	18.9	13	35.1
2. General discrimination due to				
A. Sex	5	13.5	0	0.0
B. Personality	0	0.0	1	2.7
Total 2	5	13.5	1	2.7
3. Family problems				
A. Had to relocate with family	8	21.6	2	5.4
B. Hours of work conflicted with family affairs	4	10.8	1	2.7
C. Wanted to spend more time at home and/or with children	5	13.5	1	2.7
Total 3	17	45.9	4	10.8
4. Another job				
A. Better suited or more interested	1	2.7	4	10.8
B. Better benefits (pay, advancement)	0	0.0	2	5.4
Total 4	1	2.7	6	16.2
5. Pressure, responsibility	1	2.7	2	5.4
6. Health	2	5.4	3	8.1
7. Location	1	2.7	2	5.4
8. Hours of work	1	2.7	1	2.7
9. Return to school	0	0.0	1	2.7
10. Unable to transfer to desired ATC option (type of facility)	0	0.0	3	8.1
11. Disliked particular facility (could not or would not transfer)	2	5.4	0	0.0
12. Insecurity (personal)	0	0.0	1	2.7
Total	37		37	

grouped into four categories. For the females, 38 per cent gave family reasons, 17 per cent training, 10 per cent another job, and 14 per cent "personal" reasons. Of the males, 9 per cent gave family reasons, 30 per cent training, 30 per cent another job, and 9 per cent "personal" reasons. Many of the ATC attritions for whom no SF–52 was obtained were still with the FAA in another occupation or were working for other government agencies.

B. *Reasons for Attrition from Telephone Interviews.* The reasons given for leaving ATC work in the telephone interviews are presented in Tables 1–3, respectively, for Academy, post-Academy, and combined attrition groups of each sex. For the Academy attrition groups, reasons given by males and females are highly correlated, the Spearman coefficient (r_s) being .90 ($p<.01$); all but two of the reasons are directly related to training. The r_s between sexes for the post-Academy attrition group is .69, which is also significant ($p<.01$) but accounts for about 30 per cent less of the common variance than the r_s of .90 obtained for the Academy group. The largest differences between the female and male post-Academy attrition groups involve family reasons (45.9 per cent–10.8 per cent), reasons relating to securing another job (2.7 per cent–16.2 per cent), and sex discrimination (13.5 per cent–0.0 per cent); all of these differences were statistically significant by chi-square tests ($p<.001$, $p<.05$, and $p<.05$, respectively).

C. *Reasons for Attrition from Section F of the Questionnaire.* The reasons for leaving ATC work which ranked as most important on the mail questionnaire are listed for each sex in

TABLE 3

Attrition during Academy and facility training: Main reasons for leaving FAA-ATC work as stated by 50 female and 52 male trainees in 1972 telephone interviews. All entered FAA Academy training during 1969-1970.

	Females		Males	
	N	%	N	%
1. Training failure or difficulty at the Academy or facility				
A. Did not meet training standards, lacked aptitude for ATC	7	14.0	11	21.2
B. Inadequate training	3	6.0	8	15.4
C. Too old	1	2.0	1	1.9
D. Outside distractions (personal problems)	3	6.0	1	1.9
E. Discrimination by instructors due to				
1. Sex	3	6.0	0	0.0
2. Age	1	2.0	2	3.8
3. Pilot background	1	2.0	2	3.8
4. Race	0	0.0	1	1.9
5. Lack of ATC related experience	0	0.0	1	1.9
Total 1	19	38.0	27	51.8
2. General discrimination due to				
A. Sex	6	12.0	0	0.0
B. Personality	0	0.0	1	1.9
Total 2	6	12.0	1	1.9
3. Family problems				
A. Had to relocate with family	8	16.0	2	3.8
B. Hours of work conflicted with family affairs	4	8.0	1	1.9
C. Wanted to spend more time at home and/or with children	5	10.0	1	1.9
Total 3	17	34.0	4	7.6
4. Another job				
A. Better suited or more interested	1	2.0	4	7.7
B. Better benefits (pay, advancement)	0	0.0	2	3.8
Total 4	1	2.0	6	11.5
5. Pressure, responsibility	1	2.0	3	5.8
6. Health	2	4.0	3	5.8
7. Location	1	2.0	2	3.8
8. Hours of work	1	2.0	1	1.9
9. Return to school	0	0.0	1	1.9
10. Unable to transfer to desired ATC option (type of facility)	0	0.0	3	5.8
11. Disliked particular facility (could not or would not transfer)	2	4.0	0	0.0
12. Insecurity (personal)	0	0.0	1	1.9
Total	50		52	

TABLE 4

Reasons cited as most important for leaving ATC work according to ranking by female and male attritions on Section F of the questionnaire.

	Females		Males	
	N	%	N	%
a. Disliked shift work.....	3	7.5	2	3.8
b. Pay inadequate.....				
c. Lacked aptitude for job.....			2	3.8
d. Poor working conditions in facility.....				
e. Too much responsibility in job.....	1	2.5	2	3.8
f. Discriminated against by co-workers, supervisors, or management because of my age, race, or sex.....	6*	15.0	3	5.8
g. Failed training.....	9	22.5	11	21.2
h. Health problems.....	2	5.0	3	5.8
i. Desired different geographic location.....			2	3.8
j. Family problems.....	11	27.5	4	7.7
k. Lack of motivation for job.....			3	5.8
l. Little in common with co-workers.....				
m. Disliked treatment by co-workers.....				
n. Disliked treatment by supervisors.....				
o. Training was inadequate.....	5	12.5	10	19.2
p. Got a job I considered better.....	1	2.5	5	9.6
q. Found I didn't like this type of work.....	2	5.0	2	3.8
r. Insecurity.....			1	1.9
2. Other.....			2	3.8
Total	40		52	

*All six females cited sex discrimination; two added age and one added racial discrimination.

Table 4. The questionnaire results are similar to those based on the telephone interviews (see Table 3). Reasons related to training are ranked first most often by both sexes. Family reasons are second in frequency for females, and reasons related to securing another job are second in frequency for males.

D. *Comparison of Reasons for Attrition from Job-Exit Forms and Follow-Up Telephone Interviews.* While the percentage of reasons for attrition categorized as "family" remains virtually the same from job-exit to follow-up interviews (38 per cent and 34 per cent for females, and 6 per cent and 8 per cent for males), several other reasons vary in the frequency with which they were cited on the two occasions. Reasons not originally mentioned at the time of exit from the job were presented in the telephone interviews. These include various types of alleged unfair discrimination on the job (by three females and three males), including sex discrimination mentioned by two of the three females. In addition, the percentage of all attritions who stated that they left for another position decreased from 21 per cent at job-exit to 7 per cent during the telephone interviews. Since the number of former controllers who were interviewed by telephone was appreciably larger than the number from whom job-exit information was collected, a comparison is presented for only those 63 about whom information was available from both sources (Table 5). Thirty-three (or 52 per cent) of the subjects gave the same reason on both occasions. Family reasons retained stability (job-exit N=13, follow-up N=14, and 11 of the same subjects rated "family" as a reason on both occasions). Reasons within the category "another job" appeared less reliable (job-exit N=15, follow-up N=8, eight subjects giving the same reason for both sources of data). However, whenever "another job" was mentioned in the telephone interview, it had also been mentioned on the job-exit form. The sub-category "lacked aptitude for ATC, did not meet training standards" was also unstable (job-exit N=11, follow-up N=9, five subjects giving the same reason on both occasions).

TABLE 5

Comparison of reasons for leaving ATC which were elicited at the time of trainee attrition and in the 1972 telephone interviews.

	Reason Stated on Standard Form 52 (or SF-50) Which Was Completed Upon Job Exit														
Reason Stated During Telephone Interview	training standards not met	training not adequate	distracted from training	bias in training	bias at facility	family problems	took another job; school	too much pressure	illness; health	geogr. location	hours of work	denied transfer of ATC option	disliked facility	personal and other	Totals (Phone Interviews)
training standards not met	5						1							3	9
training not adequate	1	1					2					1			5
distracted from training	1		1							1					3
bias in training	3			-								1			4
bias at facility					-		2					1			3
family problems						11	1							2	14
took another job; school							8								8
too much pressure	1							2							3
illness; health		1					1		2						4
geographical location						1				2					3
hours of work						1		1			-				2
denied transfer of ATC option		1										-			1
disliked facility								1					1	1	3
personal and other														1	1
Totals (SF-52)	11	3	1	-	-	13	15	4	2	3	-	3	1	7	63

TABLE 6

Comparison of reasons for leaving ATC which were elicited at the time of trainee attrition and in the 1972 mail questionnaires.

Reason Stated on Mail Questionnaire	Reason Stated on Standard Form 52 (or SF-50) Which Was Completed Upon Job Exit														
	training standards not met	training not adequate	distracted from training	bias in training	bias at facility	family problems	took another job; school	too much pressure	illness; health	geogr. location	hours of work	denied transfer of ATC option	disliked facility	personal and other	Totals (Questionnaires)
training standards not met	4	1					2							3	10
training not adequate	3	1				2	2					1			9
distracted from training	1		-											1	2
bias in training	1			-								1		1	3
bias at facility					-							1			1
family problems						10								1	11
took another job; school							6								6
too much pressure	1							1							2
illness; health							2		1						3
geographical location										1					1
hours of work							1	1			-				2
denied transfer of ATC option												-			-
disliked facility													1		1
personal and other							1	1						1	3
Totals (SF-52)	10	2	-	-	-	12	14	3	1	1	-	3	1	7	54

TABLE 7

Comparison of reasons for leaving ATC which were elicited from trainees in the follow-up telephone interviews and mail questionnaires.

Reason Stated on Mail Questionnaire	Reason Stated During Telephone Interview														
	training standards not met	training not adequate	distracted from training	bias in training	bias at facility	family problems	took another job; school	too much pressure	illness; health	geogr. location	hours of work	denied transfer of ATC option	disliked facility	personal and other	Totals (Questionnaires)
training standards not met	12			2			1	1							16
training not adequate	6	6	2		1	1	1								17
distracted from training			-			1									1
bias in training		1		4	1								1	1	8
bias at facility				1	3	1						1			6
family problems						13			1	2					16
took another job; school		1				1	4								6
too much pressure								3							3
illness; health		1							3						4
geographical location										1					1
hours of work						1	1				1			1	4
denied transfer of ATC option												2			2
disliked facility													1		1
personal and other					1						1			1	3
Totals (Interviews)	18	9	2	7	6	18	7	4	4	3	2	3	2	3	88

E. *Comparison of Reasons for Attrition from Job-Exit Forms and Follow-Up Questionnaires.* Results very similar to those obtained above appear when the job-exit reasons for attrition are compared to those listed on the questionnaires (Table 6), with 48 per cent agreement between these two sources. The only difference other than those cited in the above paragraph involves the sub-group "poor or inadequate training" (job-exit N=2, questionnaire N=9, one subject giving the same reason on both occasions).

F. *Comparison of Reasons for Attrition from Follow-Up Interview and Questionnaires.* When the two sources of follow-up data are compared (Table 7), 64 per cent of the former ATC trainees gave the same categorized reason for attrition in the telephone interviews and on the mail questionnaires. The largest difference again concerns "poor or inadequate training" (telephone interview N=9, questionnaire N=17, six subjects giving the same reason on both occasions). This trend in increasing criticism of training from job-exit form to follow-up telephone interview to follow-up questionnaire parallels the decreasing degree of personal involvement in each successive response situation.

The secondary reasons for attrition given in the telephone interview and on the questionnaire followed the same pattern as the main reasons. The sole departure was a tendency for both sources of data to provide fewer secondary reasons to be categorized as "lacked aptitude for ATC, did not meet training standards" (telephone interviews: primary reason 17.6 per cent, secondary reason 12.9 per cent; questionnaires: primary reason 19.6 per cent, secondary reason 0.0 per cent).

G. *Overview of Results.* Some job-exit-form reasons for leaving ATC work recorded at the time of job termination did not remain the same over time. Reasons initially given for attrition which cited another job, and, to a lesser extent, "personal" reasons lacked statistical reliability when followed up, while reasons relating to family matters were comparatively stable. Reasons concerning perceived inadequate training and job discrimination, which were totally absent in the job-exit data, were mentioned occasionally in the follow-up telephone interviews and on the questionnaires.

In analyzing all of the obtained data, four reasons appear to account for over 80 per cent of the ATC trainee attrition. These are reasons relating to training, family, other employment, and discrimination. Family-related attrition, mostly mentioned by females, appears to result from relocation with spouses, child care, and home responsibilities. These problems are often made more difficult due to the shift work present in air traffic control and the considerations involved in granting geographical transfers. Shift work creates conflicts for married controllers, especially with children, and affects women more due to their role in child care. Because of the variety of types and levels of ATC facilities (which also governs GS-levels) granting transfers for relocation would mean additional costs in training time to permit the transferees to adjust to new procedures and traffic situations.

Some of those who leave ATC work for another job (mostly males) have qualifications (e.g., a college degree) which they may feel will be better utilized in other fields. Most college degrees held by trainees are in areas other than aviation.

Attritions who indicated discrimination as a reason for leaving air traffic control work included both males and females. In the telephone interviews (Table 3), 13.4 per cent of the males and 22.0 per cent of the females alleged some kind of negative discriminatory treatment. This sex difference is not statistically significant. Eighteen per cent of the females and none of the males gave sex discrimination as a reason for attrition (this difference is significant). However, five of the nine female attritions who cited sex discrimination also mentioned other forms of discrimination on the job as a factor contributing to their leaving ATC work. Apparently women who may also sense age, race, or background discrimination believe sex is the attribute receiving the most prejudice. Some of the attritions seemed to feel they were discriminated against because of their age or background (e.g., pilot experience or college education). Thus, it is possible that some FAA personnel have a preconception of the demographic characteristics of the successful ATCS and may convey it without realizing the large variability of "group" traits. It is also possible that at least some trainees who became attritions attribute their dissatisfaction or difficulties with the job to various forms of

perceived personal bias against them by management, supervisors, or coworkers.

H. *Consistency of Present Results With Previous Research on Female Attrition.* The relative importance of family reasons in attrition of female workers has been noted in previous studies of different occupational groups. One of these studies[10] also compared job-exit reasons for attrition to those obtained in a follow-up approximately six months later. Results reported in that survey for female sewing machine operators, along with results for a followup of hospital nurses reported by Saleh, Lee, and Prien,[14] and the findings of the present study of female ATC trainees are summarized in Table 8.

Regardless of the method of obtaining the data or of the occupational group under study, family reasons represent a substantial and consistent source of motivation for attrition of women. Family ranks first for all three groups (Table 8), but the reasons next in frequency differ somewhat for the different occupations. The only other reason for attrition constituting over 5 per cent for all groups was supervision/human relations, which is appreciable only in follow-up data. The fact that ATC is a male-dominated profession, whereas the other two occupational groups consist mostly of women (including female supervisors), may account for the higher proportion of reasons (22 per cent compared to 13 per

TABLE 8

Percentages of categorized reasons for attrition which were obtained upon job-termination and/or in follow-ups for three occupational groups of women in three separate studies.

Reason for Leaving Employment	ATC Trainees		Sewing Machine Operators		Hospital Nurses	
	Exit (SF-52) %	Follow-up Interview %	Exit Interview %	Follow-up Questionnaire %	No Exit Data %	Follow-up Questionnaire %
Family (needed at home, marriage, leaving town with family)	37.9	34.0	36.5	38.0	----	34.5
Another Job	10.3	2.0	9.5	3.5	----	5.1
Did Not Meet Standards (training or production)	17.2	28.0	17.5	4.7	----	----
Pressure (work load too much)	3.4	2.0	3.5	17.5	----	2.9
Supervision/Human Relations	3.4	22.0	1.2	13.0	----	5.5
Hours (shift work)	3.4	2.0	----	----	----	5.8
Location (relocation, transportation)	3.4	2.0	4.7	5.9	----	9.0
Other	21.0	8.0	27.1	17.4	----	37.2
Follow-up response rate	89.3%		54.1%		87.7%	
Average job tenure (in months)	12.0		17.8		30	

cent and 5.5 per cent) relating attrition to supervision/human relations (including discrimination) for female ATC trainees. The decrease in reasons listed as "another job" from job-exit forms to follow-up interviews in this study was also apparent for the factory workers.

Family reasons for attrition are not necessarily limited to the married. Of those leaving ATC work in this study, some left to be with relatives, a substantial number left upon being married, and a few who had been married left when they were divorced. When hired by the FAA, only 32 per cent of the female attritions were married; the percentage of married male attritions was 58.2. At the time of attrition, however, 58.0 per cent of the females were either married or engaged while the percentage of married males remained at 58.2. In all, 19 females were either married (N=16) or divorced (N=3) between the time hired and the time attrited.

It is noteworthy that many of those females who reported leaving ATC work due to marriage, pregnancy, or to care for children, stayed out of the labor market either wholly or partly. Of the 17 females giving family reasons for attrition when interviewed by telephone, two were employed full-time, three were employed part-time, two were in college part-time, and the remaining 10 were still not employed at all. Most of these women plan to return to work eventually. In fact, during the telephone interview, 88 per cent of the attrited females and 92 per cent of the attrited males indicated that they would again consider employment with the FAA. Moreover, 76 per cent and 58 per cent, respectively, of the attrited females and males said they would consider reapplying for FAA air traffic control work.

I. *Implications.* Several studies[1 5 7 12] have indicated that attrition rates for female employees are substantially higher than those for males. The results of the present study, and others which have examined different occupational groups,[10 14] indicate that most of the difference in attrition rates between the sexes appears due to the demands of the female's role in family-related areas. Thus, under present socio-cultural conditions, current approaches by the FAA to increased hiring of females in ATC work will probably mean increased levels of attrition. Some reduction in this high rate of female attrition might result from changes in administrative policies regarding geographic or facility transfers and the requirement of shift work for ATC personnel. In addition to such changes, which would also apply to males, present data suggest that overall ATC attrition rates might be reduced without sacrificing desired performance standards by (a) improved orientation of prospective hirees regarding the nature, demands, and rewards of ATC work, (b) slowing the pace of training, (c) improving the qualification standards for selection of instructors both at the Academy and at facilities, and (d) training ATC instructors with regard to fair treatment of all trainees, motivational techniques in instruction, and the psychology of both the teaching and the learning process.

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APPENDIX A

Telephone Interview

Is this Mr. (or Ms.) _____? My name is _____, and I am at the Civil Aeromedical Institute in Oklahoma City. We have been conducting a study of Air Traffic Controllers at the Academy and on-the-job with the aim of better understanding the problems and the satisfactions of being an ATC specialist. We would like to obtain some information from you for research purposes. Would you mind answering a few questions related to your tenure as an Air Traffic Control Specialist? All information will be kept confidential.

A. Our records indicate you are no longer working as an FAA ATC.
   What were the reasons for your leaving ATC work?
   What was the main reason?
   Was this the reason that was stated on your resignation form?

B. Are you currently working?
   (if yes) Full-time?
   How long have you been there?
   Did you start work right after you resigned from the FAA?
   Tell me about your job. (Interviewer should try to elicit what interviewee thinks job future is; if it involves shift work; whether the salary is more or less than it would have been as a journeyman ATC.)

   (If no) Are you currently in school?
   What are you studying?
   What do you hope to do when you finish?

C. Are you presently married?
   (If yes) For how long?
   (If no) Have you ever been married?
   (If yes) When?
   (If yes) Do you have any children?
   (If yes) What are their ages?
   (If young) How are they being cared for (e.g., licensed day care program, baby sitter, or by their mother if respondent is male or not working)?

D. Would you consider FAA ATC work again?
   (If no) Would you consider any other FAA work?

We would like to mail you a brief questionnaire to get an idea of how you viewed different aspects of the ATC job. It will take about 20 minutes to complete and your responses will be kept confidential. May we send you this questionnaire? (Interviewer should verify address)

APPENDIX B

Section F of Questionnaire

F. Below is a list of possible reasons why some people leave their jobs. Only one reason may be important or several may contribute to leaving. Please rank those items which were most important in your leaving FAA-ATC work. You may rank as many as four items. Please read through all of the items before you begin ranking.

If only one item was important, put a "1" in the space provided to the left of the item. If two items were important reasons, rank the most important reason "1" and the second most important "2." Follow the same procedure if you want to rank three or four items, but rank no more than four. If you choose any items from g through t, please complete the statement, circle alternatives, or give examples as required. The last two items permit you to write in important reasons which may not be listed.

____ a. Disliked shift work.

____ b. Pay inadequate.

____ c. Lacked aptitude for job.

____ d. Poor working conditions in facility.

____ e. Too much responsibility in job.

____ f. Discriminated against by co-workers, supervisors, management because of my age, race, sex. (Circle any appropriate underlined words.)

____ g. Failed training because _____

____ h. Health problems due to _____

____ i. Desired different geographic location because _____

____ j. Family problems because _____

____ k. Lack of motivation for job because _____

____ l. Little in common with co-workers because _____

____ m. Disliked treatment by co-workers: (example) _____

____ n. Disliked treatment by supervisors: (example) _____

____ o. Training was inadequate because _____

____ p. Got a job I considered better because _____

____ q. Found I didn't like this type of work because _____

____ r. Insecurity due to _____

____ s. Other: (specify) _____

____ t. Other: (specify) _____