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A COMPARISON OF THE JOB ATTITUDES AND INTEREST PATTERNS OF AIR TRAFFIC AND AIRWAY FACILITY PERSONNEL

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16. Abstract
Air traffic control specialists (ATCSs) and airway facility technicians (AFTs) were compared on measures of job attitudes and interests. A total of 792 ATCSs and 2,366 AFTs completed the Strong Vocational Interest Blank (SVIB) and questionnaires concerning job satisfaction and job attitudes. Both groups indicated high overall job satisfaction and general agreement about areas of job satisfaction and dissatisfaction. However, ATCSs reported more satisfaction than AFTs from various aspects of the work itself and from salary, while AFTs were more satisfied with responsibility, working conditions, and Civil Service retirement. The AFTs were more favorable to management than ATCSs. On the SVIB, ATCSs had higher scores than AFTs on scales concerned with interpersonally oriented vocations (e.g., social service, sales) and lower scores on technical-scientific occupational scales. The findings suggest that these two employee groups have much in common with respect to their attitudes toward work while at the same time having certain discriminable characteristics that have implications for both personnel and motivational programs.

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I. Introduction.

In developing personnel programs for the FAA, it is important to consider various attitudes, interests, and motivations of the major segments of that work force. To this point, most of the agency's research in these areas has been devoted to the understanding of air traffic control specialists (ATCSs) and their work, including studies of job attitudes (4,5) and job interests (6). Recently, however, an extensive study of airway facility technicians (AFTs) has also been completed (7). It is the purpose of this report to compare the findings from the ATCS and AFT surveys in detail to gain additional perspective about the specific needs of these two large groups of aviation personnel.

II. Method.

A. Subjects. The data for the ATCSs were taken from an extensive survey of controller attitudes previously reported (4). In that survey, a total of 792 ATCSs from 18 air traffic installations in various geographical regions voluntarily participated. These respondents came from six air route traffic control centers, six terminal area facilities (towers and approach control), and six large flight service stations. The average age of the ATCSs was 35.3 years and the average length of experience as a journeyman controller was 9.3 years.

The group of AFT volunteers totaled 2,366 (7). Compared to ATCSs, AFTs work in a wider variety of settings and locations, with more than half working in small facilities. To sample this wide range of employment circumstances, responses to this survey were obtained from more than 200 different facilities dispersed across the geographical regions of the FAA. The average age of the AFTs was 41.9 years; the average length of FAA experience was 12.1 years.

B. Questionnaires. Both groups were given extensive questionnaires, substantial portions of which were designed particularly for the specific group being surveyed. The focus of this comparison study is on the three common sections of the surveys concerned with job satisfaction, job attitudes, and vocational interests.

1. Job satisfaction. The basic measure of overall job satisfaction was a 5-point scale that ranged from "very satisfied" to "very dissatisfied." The ATCSs were asked how well satisfied they were with being controllers, while the AFTs were asked how satisfied they were with their occupations, since a variety of technical vocations are represented in the AFT work force.

2. Job attitudes. Two questionnaires were used to assess job attitudes. First, a general open-ended questionnaire was provided that asked each respondent to indicate in his or her own words what three things were

liked best and least about working as an ATCS or AFT. The second job attitude questionnaire concerned how much the respondents liked or disliked various specific aspects of their work (e.g., challenge, workload, peers, salary). A 5-point rating scale was used for each item that ranged from "like very much" to "dislike very much."

3. Job interests. A total of 787 of the 792 participating ATCSs completed the 1966 form of the Strong Vocational Interest Blank (SVIB) (2). Of the 2,366 AFTs who volunteered to participate in this survey, 500 were randomly selected to receive the SVIB. This limited sample was chosen so as to maximize both the representativeness of the sample and cost efficiency for this aspect of the study. A total of 400 usable SVIBs were returned, a sample size that yields a 95 percent level of confidence that obtained scale values are within 5 percent of the true group values. The sample of ATCSs easily met this same requirement. This 399-item inventory documents individual preferences for various occupational, educational, recreational, and civic activities. The responses were scored for the 54 occupational scales as well as for an experimental scale developed for air traffic controllers (6).

C. Procedure. Each participant was provided, either by direct solicitation or by mail, with a packet of questionnaires. The questionnaires were filled out at the convenience of the respondent, although it was requested that they respond as soon as possible. The questionnaires were anonymous, and each participant was provided an envelope in which to seal the completed questionnaire for return directly to the researcher.

III. Results and Discussion.

A. Job Satisfaction. Both groups reported a high degree of overall job satisfaction. For the ATCS group, 91 percent reported that they were "satisfied" or "very satisfied" with working as air traffic controllers. Of those in the AFT group, 90 percent indicated a similar satisfaction with their work as technicians. These percentages did not differ significantly by statistical test. Only 3 ATCSs and 12 AFTs reported themselves as "very dissatisfied."

The percentages of satisfied responses obtained from these two groups of FAA employees are somewhat higher than those typically reported for employees in other types of industrial-organizational settings (3,8). In most of these studies, 70 percent to 80 percent of the nonsupervisory personnel who responded indicated some degree of overall job satisfaction. The values obtained from AFTs and ATCSs are more typical of those obtained from managerial and professional (defined as requiring at least a bachelor's degree for entry into the professional field) respondents (3).

B. Job Attitudes. The statements given in response to the open-ended part of the likes-dislikes questionnaire were classified according to the Herzberg Motivator-Hygiene categories (2). This system has been used in a variety of employment settings and provides a framework for comparative

evaluation of the work-related attitudes of FAA employees with the attitudes of those in other types of work situations.

In general the patterns of responses given by the ATCSs and AFTs were similar (Figure 1). Spearman rank-order correlations between rankings of the percentages of "likes" statements accounted for by each of the factors for the two groups was .65 ($p < .01$); for the "dislikes" statements, .62 ($p < .01$). In other words, both groups generally tended to cite the same factors as being the most important contributors to what they liked and did not like about their work. For both groups, the Work Itself factor accounted for the greatest percentage of likes responses. For dislikes, the Management, Working Conditions, and Work Itself factors were most prominent. Also, as predicted by Motivator-Hygiene theory, the motivator factors (such as Work Itself, Achievement) accounted for the majority of likes statements and the hygiene factors (such as Working Conditions, Management) for the majority of dislikes statements made by both groups.

Although the overall patterns of responses were similar for both groups, there were also several significant and meaningful differences between the two groups on specific factors. First, there was a greater proportion of dislikes statements accounted for by the hygiene factors in the ATCS group than in the AFT group ($x^2=103.2$, df=1, $p < .01$), as somewhat more than three-fourths of the ATCS statements and about two-thirds of the AFT responses were classified under hygiene factors. This difference in proportions was due primarily to the significantly greater proportion of ATCS dislike statements in the hygiene factor of Management ($x^2=61.9$, df=1, $p < .01$), and the relatively fewer ATCS dislike statements in the motivator factor of Work Itself ($x^2=31.4$, df=1, $p < .01$).

With respect to what is liked about work, a significant greater proportion of ATCS comments were about Work Itself than was true for AFTs ($x^2=22.1$, df=1, $p < .01$). The ATCSs also made proportionally more positive statements about Salary ($x^2=33.6$, df=1, $p < .01$) than AFTs. On the other hand, AFTs were more likely than ATCSs to mention Responsibility ($x^2=38.2$, df=1, $p < .01$) and Working Conditions, ($x^2=80.8$, df=1, $p < .01$) favorably.

There were several other factors for which statistically significant effects were noted; however, the small magnitudes of the percentages of these responses suggest that the research significance of these differences is limited.

The second part of the job attitude portion of the questionnaire concerned how much the respondents liked or disliked various specific characteristics or aspects of their work situations (Table 1). Again, as with the open-ended questionnaire, the general agreement in rankings of items was substantial as indicated by a Spearman rank-order correlation of .80 ($p < .01$). However, while there was general agreement in the rankings of the items in terms of how well each was liked by the two groups, there were also significant differences between the groups on 27 of 29 items. The two items for which the percentages of respondents in the two groups were equal were the highly rated item of Association With Coworkers, and the low rated item

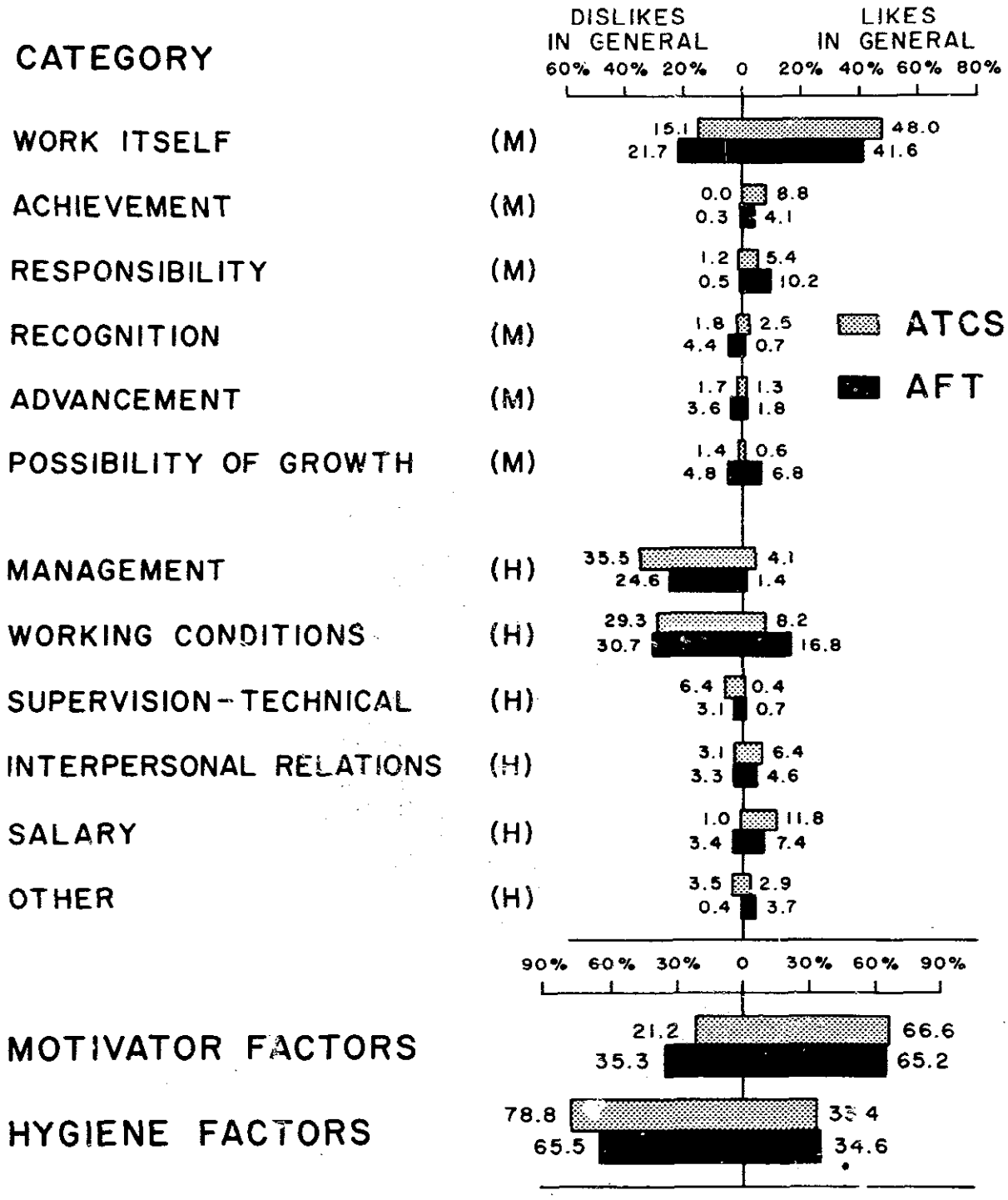

Figure 1. Percentages of likes and dislikes statements classified in each Herzberg-Motivator Hygiene factor.

TABLE 1. Like and Dislike Ratings for Various Aspects of ATCS and AFT Work

Scale	ATCS % Liking	AFT % Liking
Challenge of Work	97.5	86.8*[a]
Working in Aviation	97.4	80.6*
Job Tasks	94.8	79.2*
Association With Coworkers	91.2	89.1
ATCS/AFT Career	90.8	84.0*
Service to Aviation	90.2	84.2*
Work Variety	89.7	78.8*
Respect and Prestige	85.8	58.9*
Difficulty of Work	83.8	75.6*
Moderate Workloads	82.6	70.8*
Salary	81.8	72.9*
Heavy Workloads	67.2	50.6*
General Workload	65.7	53.4*
Working Day Shifts (0800-1600)	65.2	78.5*
Retirement Benefits	59.6	89.1*
Working in Civil Service	53.8	81.3*
Rotating Shifts	53.4	21.7*
Evening Shifts (1600-2400)	50.3	36.3*
Physical Work Environment	48.9	64.8*
Established Work Procedures	42.3	45.0*
Promotion Opportunities	39.3	38.4
Number of Trained Coworkers	38.0	59.6*
Quality of Supervision	33.2	56.7*
Miscellaneous Duties	29.3	31.0*
Quality of Local Management	27.6	41.7*
Light Workloads	20.9	23.5*
Midshifts (2400-0800)	16.0	9.2*
Regional Management	15.0	23.5*
National Management	11.5	19.9*

[a] *indicates difference in percentages significant at $p < .01$ level or better.

of Promotion Opportunities. In addition, the significant differences on three other items, Established Work Procedures, Miscellaneous Duties, and Light Workloads, all of which were toward the lower end of the distribution of ratings, involved differences of less than 5 percent and thus have little research meaning.

The ATCSs gave higher ratings than AFTs on 15 scales. For 10 of these, the differences in percentages exceeded 10 percent. These items were primarily concerned with aspects of the work itself such as Challenge of the Work, Working in Aviation, the Job Tasks of the work, and Work Variety. The ATCSs were also considerably more positive about their workloads than AFTs, particularly Heavy Workloads. They also liked working Rotating Shifts and Evening Shifts much more so than AFTs. The remaining differences ranged between 6 and 10 percent and concerned Service to Aviation, the ATCS/AFT Career, Work Difficulty, Salary, and Working Midshifts (which very few in either group liked).

The AFTs liked nine specific aspects of work substantially more so than ATCSs. The items for which the differences exceeded 10 percent were Retirement Benefits, Working in Civil Service, Working Day Shifts, Physical Work Environment, and Number of Trained Coworkers. The AFTs reported more positive feelings than ATCSs on each of the four items concerning management and supervision; however, the differences exceeded 10 percent on only the Quality of Supervision and Quality of Local Management items. The differences on the National Management and Regional Management items were 8.4 and 8.5 percent, respectively.

C. SVIB. The patterns of SVIB responses of the two groups were moderately correlated as shown by a Spearman rank-order correlation of .41 ($p < .01$) for the orders of scores on scales for the two groups (Table 2). As a rule, neither group scored particularly high on any of the scales. The highest score in either group was obtained by AFTs on the Computer Programmer scale; that score fell in the B+ range as described by Campbell (1) which indicates a reasonably high correspondence between interests of AFTs and successful computer programmers but is still not as high a score as most programmers will obtain. The participants from both groups scored in the range typical for men-in-general on 25 of the scales, ATCSs scored like men-in-general on an additional 13 scales, and the AFTs scored likewise on another four scales. These findings indicate that, for the most part, respondents from these two FAA employee groups do not show a strong tendency to share specific interest patterns with individuals in any of the professional and occupational groups represented on the SVIB.

The five scales on which both groups scored above men-in-general were Army Officer, Air Force Officer, Physical Therapist, Musician Performer, and the scale specially developed for Air Traffic Controllers. The ATCSs scored above men-in-general on an additional three scales; Real Estate Sales, Community Recreation Administrator, and Chamber of Commerce Executive. The average score of the AFT group was higher than men-in-general on another seven scales including the Physician, Biologist, Physicist, Chemist, Carpenter, Math-Science Teacher, and Computer Programmer.

Both groups scored below men-in-general on the eight scales of School Superintendent, CPA Owner, Sales Manager, Life Insurance Sales, Advertising

TABLE 2. Mean Strong Vocational Interest Blank Scores for Air Traffic Control Specialists (ATCSs) and Airway Facility Technicians (AFTs) and for Men-in-General as Reported by Campbell (1)

Scale[a]	Men-in-General[b]	ATCS Score	ATCS Rating[c]	AFT Score	AFT Rating[c]	Significance[d] of ATCS/AFT Difference
Group I Professional/Biosciences						
Dentist	27-36	29.1	C+	33.6	B-	*
Osteopath	23-33	30.4	B	30.9	B-	ns
Veterinarian	22-32	31.2	B	29.5	B-	*
Physician	21-32	29.1	C+	32.6	B-	*
Psychiatrist	16-26	22.1	C	24.6	C+	*
Psychologist	17-28	22.9	C	27.6	C+	*
Biologist	18-29	24.7	C+	33.9	B-	*
Group II Professional/Physical Sciences						
Architect	24-35	25.3	C+	31.6	B-	*
Mathematician	18-29	16.7	C	25.7	C+	*
Physicist	14-27	18.4	C	29.7	B-	*
Chemist	20-33	26.6	C+	38.1	B	*
Engineer	26-38	26.5	C+	36.9	B	*
Group III Technical/Supervision						
Production Manager	31-41	35.2	B	38.1	B	*
Army Officer	15-26	36.0	B	35.0	B	ns
Air Force Officer	20-29	37.3	B	38.5	B	ns
Group IV Skilled Trades/Technical						
Carpenter	19-30	27.8	C+	33.9	B-	*
Forest Service	18-29	28.2	C+	27.7	C+	ns
Farmer	31-41	35.8	B	38.5	B	*
Math-Science Teacher	22-33	32.1	B-	37.1	B	*
Printer	27-36	35.0	B	35.8	B	ns
Policeman	19-28	27.0	C+	24.4	C	*
Group V Social Service						
Personnel Director	24-35	25.0	C+	21.4	C	*
Public Administrator	28-39	34.6	B	32.5	B-	*
Rehabilitation Counselor	21-30	24.9	B-	25.3	C+	*
YMCA Secretary	11-22	29.5	B-	19.3	C	*
Social Worker	15-27	26.5	B-	20.7	C	*
Social Science Teacher	23-34	28.1	B-	19.7	C	*
School Superintendent	20-31	17.0	C	13.8	C	*
Minister	10-23	11.9	C	11.1	C	ns
Group VI Cultural/Humanities						
Librarian	20-30	24.1	C	25.2	B-	ns
Artist	23-32	25.7	B-	28.6	B-	*
Musician Performer	24-33	33.8	B-	33.7	B-	ns
Music Teacher	18-28	23.4	C	21.3	C	*
Group VII CPA Owner	25-34	21.1	C	22.2	C	ns
Group VIII Business/Finance						
Senior CPA	21-32	29.4	B-	31.6	B	*
Accountant	25-37	27.3	B-	28.2	B-	ns
Office Worker	28-39	29.7	B	26.5	B-	*
Purchasing Agent	31-41	34.0	B	33.3	B	ns
Banker	27-37	27.5	B-	25.4	B-	*
Pharmacist	25-34	30.7	B	29.2	B-	*
Mortician	28-37	31.4	B	25.9	B-	*
Group IX Sales						
Sales Manager	27-38	26.4	B-	20.1	C	*
Real Estate Sales	33-41	33.9	B	28.3	B-	*
Life Insurance Sales	26-37	25.6	B-	18.4	C	*
Group X Verbal/Linguistic						
Advertising Man	27-37	26.0	C+	22.2	C	*
Lawyer	30-39	27.2	C+	25.0	C+	*
Author-Journalist	28-36	27.6	C+	26.8	C+	ns
Group XI President, Manufacturing Company	24-40	22.0	C	21.8	C	ns
Group XII Supplemental Scales						
Credit Manager	23-34	33.9	B-	27.8	C+	*
Chamber of Commerce Executive	24-34	34.4	B-	26.5	C+	*
Physical Therapist	19-30	39.1	B	36.5	B	*
Computer Programmer	28-39	37.0	B	43.4	B+	*
Business Education Teacher	23-33	31.9	B-	26.6	C+	*
Community Recreation Administrator	13-24	31.5	B-	22.1	C	*
Group XIII Air Traffic Controller	29-39	50.0	A	43.6	B+	*

[a] Each occupational group has a mean score of 50 on its own scale.
[b] The range of scores representing the middle third of the distribution of scores for men-in-general.
[c] Letter ratings indicate the degree of correspondence between interest patterns of the occupational group represented in the Scale column and the patterns of the ATC and the AFT groups as reported by Campbell (1).
A (standard score above 44.5) - very high correspondence
B+ (standard score between 39.5-44.5) - high correspondence
B (standard score between 34.5-39.5) - moderate correspondence
B- (standard score between 29.5-34.5) - slight correspondence
C (standard score below 29.5) - very little to no correspondence
[d] *indicates difference between ATCS and AFT scale scores is significant at $p < .01$ level or better.

Man, Lawyer, Author-Journalist, and President of Manufacturing Company. The ATCSs scored lower than men-in-general on only one additional scale, that of Mathematician, while AFTs had lower scores on the scales of Personnel Director, Social Science Teacher, Office Worker, Banker, Mortician, and Real Estate Sales.

There were statistically significant differences between the mean scores for the ATCS and AFT groups on 42 of the 55 scales. There are two trends in these differences that have clear research significance. Controllers scored significantly higher than AFTs on seven of the eight scales in Group V (Social Service) and on all three scales in Group IX (Sales). The AFTs on the other hand scored higher on six of seven scales in Group I (Professional/Biosciences), all five scales of Group II (Professional/Physical Sciences), and four of six scales in Group IV (Skilled Trades/Technical). In other words, ATCSs scored high relative to AFTs on interpersonally oriented vocations, while AFTs were relatively higher on technical-scientific scales.

The second trend is clearly supportive of the notion that ATCS and AFT employees differ in their emphasis on the interpersonal versus the technical. On the 21 scales for which the ATCS-AFT difference in mean score was 5 points or more, the AFTs yielded the higher score on nine technically oriented scales (Engineer, Computer Programmer, Chemist, Carpenter, Physicist, Mathematician, Architect, Biologist, and Math-Science Teacher). The ATCSs scored higher on the ATCS scale (as would be expected) and 10 scales dealing with interpersonal activities (Community Recreation Administrator, Business Education Teacher, Chamber of Commerce Executive, Credit Manager, YMCA Secretary, Social Worker, Social Science Teacher, Sales Manager, Life Insurance Sales and Real Estate Sales). The other scale on which the ATCSs scored notably higher was the Mortician scale (just what this reflects is not clear). It should be noted that these are comparative statements between the two FAA groups only. Neither group was remarkably "people" or "thing" oriented when compared to men-in-general.

IV. Conclusions.

In sum, these findings suggest that these two employee groups have much in common with respect to their attitudes and motivations toward work, while at the same time having certain discriminable characteristics that have implications for personnel and motivational programs.

First, both groups find much that is satisfying in their work; more so than the typical technical employee in industry. However, their satisfactions in work are generally mediated by the same factors that apply to employees in other settings; motivator factors, particularly work itself, are the greatest sources of job satisfaction. Hygiene factors, such as management and working conditions, contribute most to dissatisfaction. These findings are typical for employee surveys of this type.

While similar in general, there were also significant differences between the ATCS and AFT groups in several aspects of their job attitudes. The ATCS group responded more favorably to the work itself and the challenge of the work than AFTs, while for the AFTs the career aspects of working in FAA assumed relatively greater importance. This suggests that security issues are relatively more important to the motivations of AFTs than ATCSs. The ATCSs were notably more critical of management than AFTs; AFTs had more dissatisfaction with certain job tasks, most notably paperwork. And while neither group liked working night (2400 to 0800) shifts, ATCS personnel were considerably more positive toward rotating shifts than AFT employees. Some of these differences may be due in part to the higher average age of the AFT group.

As a last point, it is clear that the interest patterns, particularly of ATCSs, are fairly typical of men-in-general. However, ATCSs show considerably more interest in the interpersonal aspects of work than AFTs, while AFTs are more equipment oriented. This suggests that motivational programs emphasizing interactions, group processes, and team effort will have greater consequences for ATCSs than AFTs. For AFTs, programs that emphasize technical aspects of individual development will probably have relatively greater appeal. However, this should not be interpreted to mean that AFTs have no interest in or need for interpersonal activities in work, or that ATCSs have no technical interest. Both groups have needs and interests in both areas; the thrust of these findings simply suggests areas for emphasis in developing motivational and morale programs for these groups.

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