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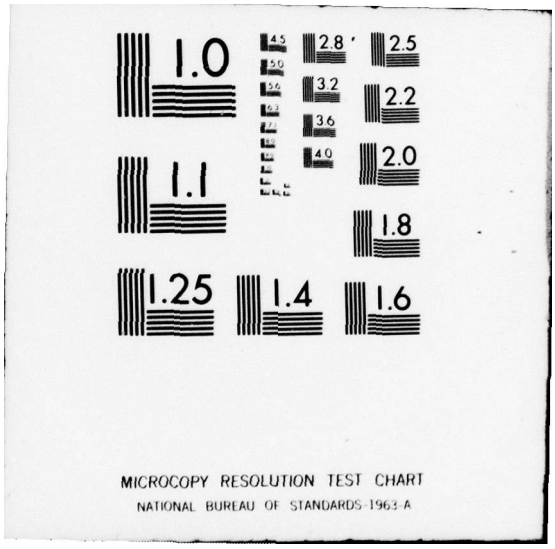
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EXPECTANCY THEORY AS A PREDICTIVE MODEL OF CAREER INTENT, JOB SATISFACTION, AND INSTITUTION-OCCUPATION ORIENTATION AMONG AIR FORCE OFFICER SCIENTISTS AND ENGINEERS

THESIS

AFIT/GSM/SM/78S-15

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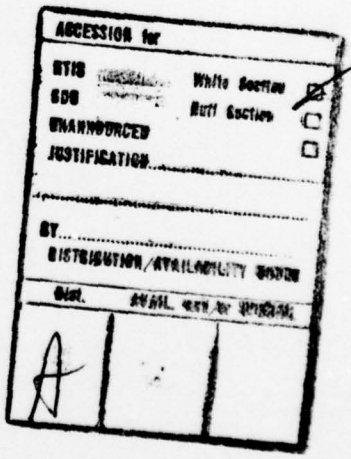

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This has, for me, been a most satisfying and rewarding effort.

Logan M. Lewis

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ABSTRACT

This research study examines career intent, job satisfaction, and institution-occupation orientation among members of the scientific and engineering career fields (26XX and 28XX, respectively) using a model of behavioral choice and motivation known as Expectancy Theory. The research was conducted via analysis of questionnaires from 617 Air Force scientists and engineers located at various bases and stations throughout the United States.

The combinatorial and predictive properties of the Expectancy Theory model were tested using both within-person and across-person methodologies for 20 separate career outcomes. The data for the career intent predictions were utilized for the whole sample, and then tested separately for the five-year groups represented.

In all, the Expectancy Theory model was quite powerful in predicting career intent. The within-person test yielded a bivariate correlation (r) of .52 for the total sample and .73 for the officers with three to four years of total service. The across-person test (a stepwise multiple regression) of career intent with Expectancy Theory components for the 20 career outcomes produced a multiple correlation coefficient (R) of .65 for the total sample and .84 for the three- to four-year group. The two principal predictors of career intent for the total sample were (1) a feeling of self-fulfillment and accomplishment and (2) the opinion of the immediate family. These predictors embody measures of both the desire for the career outcome listed and the perceived association between the outcome and a specified career. The two principal predictors

for the three- to four-year group were associated with the outcomes of (1) the opinion of the immediate family and (2) a fair and unbiased performance appraisal system.

Job satisfaction for the within- and across-person tests produced an $\underline{r}$ of .42 and a multiple $\underline{R}$ of .62 using the total sample. The principal predictor of job satisfaction was a feeling of self-fulfillment and accomplishment. The tests on the total sample for instruction orientation yielded correlations of .17 (within-person) and .34 (across-person) with a principal outcome of discipline. Similar testing of occupation orientation resulted in an $\underline{r}$ of -.57 (within-person) and a multiple $\underline{R}$ of .63 (across-person). The principal outcome was utilization of training and abilities.

In addition to the actual predictive testing, this report includes an extensive literature review of Expectancy Theory and some analysis of the behavior of its components in the tests along with recommendations for improvement of the methodology for measuring the components.

EXPECTANCY THEORY AS A PREDICTIVE MODEL OF CAREER INTENT, JOB SATISFACTION, AND INSTITUTION-OCCUPATION ORIENTATION AMONG AIR FORCE OFFICER SCIENTISTS AND ENGINEERS

I. Introduction

Background

The aviation and aerospace industries of the 1970's have evolved into complex, technical, and highly specialized organizations. The continuing development of weapons systems, space hardware, and new aircraft requires a high level of scientific and technical competence within the Air Force.

In a recent letter to the heads of the various research and development (R&D) groups within the Air Force Systems Command (AFSC), General Lew Allen, Commander of AFSC, discussed the manning prospects for engineers in the Air Force:

> As this Command has 64 percent of the total Air Force resources in this speciality, we are the most severely impacted by this negative trend. No improvement is in sight; as a matter of fact, forecasts point to a level of 50 percent in the 28XX field by FY 1980. We must react to that eventuality now (Allen, 1978).

The letter goes on to note that one of the major impediments to acquiring new engineers is the highly competitive civilian job market combined with a shrinking number of engineering graduates. Table I shows the relative manning levels of engineers compared with the other primary career fields within the Air Force R&D establishment.

Table I

R&D Manning Levels

AFSC	Title	Manning Level	
		1978[a]	1980[b]
26XX	Scientific	96%	100%
27XX	Acquisition Management	94%	100%
28XX	Development Engineering	86%	50%
29XX	System Program Management	93%	100%
Overall R&D		90%	75%

[a]Current levels
[b]Projected levels

As identified by General Allen, a prime problem for the Air Force R&D community is attracting and retaining a sufficient number of engineers to support Air Force research efforts. To date, there have been no published studies that this writer was able to locate that deal with this particular problem.

Previous Research. Since the end of the draft and the implementation of the all volunteer force concept, there have been many studies done concerning general retention and turnover in the Air Force: Hoiberg, Hysham, and Berry (1977); Feris and Peters (1976); Foley (1976); Grace, Holoter, and Soderquist (1976); Koch and Steers (1976); Lassiter and Proctor (1976); and Parker (1974). None of these studies directly address the problem of retention in the scientific and engineering career fields and few of them work with any sort of conceptual model to predict turnover.

Patterson (1977), Vrooman (1976), and Thompson (1975) all worked with data from Quality of Air Force Life (QOAFL) surveys in developing multivariate models of career intent and job satisfaction. However, the

research was approached from a model-seeking standpoint rather than beginning with a preconceived theoretical model.

Purpose of the Study

This study attempts to provide useful retention/turnover information to the Air Force for scientists and engineers with the use of a specific behavioral model. The model will be used to investigate factors which are hypothesized to contribute significantly to a person's decision to remain in or separate from the Air Force.

Expectancy Theory. The particular behavioral model chosen for this study is Expectancy Theory, proposed by Victor Vroom in 1964. Since then many investigators have examined the theory both conceptually and empirically. The results of these studies have been as mixed as the methodologies used in testing the theory. This study applies the theory in a manner as consistent as possible with Vroom's original presentation to test the predictive abilities of the original proposition.

> Problem Statement. How powerful is formal Expectancy Theory as a predictor of career intent, job satisfaction, and institution-occupation orientations for first-term officers in the scientific and engineering career fields?

Objectives. Two principal objectives follow from the problem statement:

(1) Identify the outcomes and rewards that are the most closely related to career intent, job satisfaction, and institution-occupation orientation.

(2) Test the effectiveness of Expectancy Theory as a method of accomplishing (1).

Research efforts to achieve these objectives were constrained by certain limitations on the study.

Limitations. One of the principal restrictions on a research project of this type is limited time. This constraint was felt throughout the research. Further limitations were imposed by the use of a mailed questionnaire to gather data. This method was chosen as the most time efficient. However, it does have some drawbacks. One of these is constructing the questionnaire to encourage response. In the study, the overall length of the questionnaire was controlled so a potential respondent would not be discouraged by an instrument that appeared formidible in length.

Theoretically, the approach taken in this research was to follow Vroom's fomulation of the Expectancy Model as closely as possible. The theory allows for examining as wide a range of job or career outcomes and rewards as desired; however, the number of outcomes actually used was limited to those used or implied in prior research and by consideration of questionnaire length. There are other limitations and some specific assumptions that play an important role in the conduct of the research; however, they stem from the theory and associated mathematical models which must be explained in order to understand the nature of these assumptions and limitations. As a result, they are presented in Chapter II in conjunction with the development of the theory.

II. Conceptual Background and Hypotheses to be Tested

Antecedents and Predictors of Turnover

Numerous studies have been done both in the military and in civilian industry to determine why employees resign and, conversely, why they remain. This issue is of interest from the scientific standpoint as a study in individual human behavior. From an organizational position, turnover is important because of its impact on costs and efficiency. Because of the often large investments in its personnel, the military in general and the Air Force in particular are especially interested in understanding the nature and causes of personnel turnover.

General Turnover Research

Two comprehensive literature reviews, Porter and Steers (1973) and Mobley et al. (1977), encompass over 160 studies of various factors related to the turnover process. The bulk of the studies reviewed were based in the private sector and provide an excellent picture of the state-of-the-art in private sector turnover research. Mobley et al. (1977) reviewed Porter and Steers (1973) and the research done since then. These two reviews list the following as some of the variables of interest to investigators of turnover (Mobley et al., 1977, pp. 70-72):

1. Personal Characteristics
    - A. Age
    - B. Tenure
    - C. Sex
    - D. Education
2. Overall Job Satisfaction
3. Organizational and Job Characteristics
    - A. Pay
    - B. Promotion

C. Supervision Style
D. Role Clarity and Met Expectations
E. Job Autonomy and Responsibility

4. External Environment

A. Level of Employment/Opportunity
B. Perceived Alternatives

5. Additional Factors

A. Intentions to Quit
B. Commitment/Attachment

This outline of factors related to turnover, while not exhaustive, provides a guide for examining the various results more closely, including some from military studies. Also, attention is directed toward the applicability of the results of this study. The goal is to isolate the specific factors that appear to be significantly related to turnover and are potentially useful within the framework of the theoretical model that is developed later in the chapter.

Personal Characteristics as Related to Turnover. The question of age and turnover has been examined by several researchers, and the results of these studies show a consistently negative relationship between age and turnover (Porter and Steers, 1973; Mobley et al., 1977). However, deciding the issue of whether to remain in or leave a particular job is a psychological process; and even through the decision may be altered by some outside agency, the approach to understanding turnover would appear to begin with identifying the internal, conceptual factors guiding the decision-making process (Vroom, 1964).

In this respect, factors such as age pose a problem. While they are statistically linked to turnover, they are conceptually somewhat difficult to incorporate into the behavioral model chosen for this study.

The group of factors that are of principal interest in this study are those than can be supplied by the organization or generated internally by the individual.

Job tenure has also been found to be consistently and negatively related to turnover. Using a multivariate study, Mangione (1973) found length of service to be one of the best single predictors of turnover. In addition, the many related aspects of age and tenure imply that the two factors are likely to covary to some extent.

The remaining characteristics of sex and education have not received a great deal of attention. Porter and Steers (1973) did not report any studies that considered these characteristics. Mobley et al. (1977) presented both of these characteristics as separate categories but found no clear-cut conclusions regarding either of them. An Army study (DAPC-PMP, 1973) examined the relationship between turnover and education using career intent as an analog of turnover. The study was conducted using junior officers as subjects and found that of those having an advanced degree over 75 percent did not intend to make the Army a career.

Variables such as this group of personal characteristics have often been studies independently of one another. A priori consideration of these variables would indicate some possible interaction (e.g., age and tenure). Mobley et al. (1977) stresses this point and concludes that some form of multivariate model would be the best approach to the study of turnover. This type of model would provide a measure of the interaction between variables and offer better insight into the psychology of the turnover process. In accord with this concept, this study utilizes a multivariate model in analyzing career intent.

Overall Job Satisfaction in Relation to Turnover. Porter and Steers (1973) reviewed a group of 15 studies of job satisfaction prior to 1973 (two involving military subjects). All but one showed a negative correlation between turnover and job satisfaction. The one exception to this showed no relationship at all. Unfortunately, Porter and Steers did not report the strength or significance of the relationships. Mobley et al. (1977) extended their report to cover actual correlations; and in a review of seven studies performed since 1973, found that the variance explained, though significant, was at best less than 14 percent with some studies showing explained variance as low as 3 percent. In spite of this, job satisfaction appears to be a relevant factor in the psychology of turnover.

Mobley et al. (1977) attempts to account for the rather low correlations by developing a heuristic model of the turnover process in relation to job satisfaction. The primary purpose of this model is to identify a possible set of intermediate linkages between job satisfaction and turnover. The elements that serve as links account for variables such as available alternatives and the expected utility of searching out these alternatives. This study uses an Expectancy Theory model which also incorporates concepts of utility and alternate opportunities, but it combines them in a distinctly different fashion such that the model can predict both job satisfaction and turnover directly rather than merely linking the two.

Another consideration is the issue of what an organization can do to alter someone's level of satisfaction. Like turnover, satisfaction is susceptible to being reduced to a more basic set of components. In a fashion similar to Mobley et al.'s (1977) investigation of variables contributing to the psychology of the turnover process, there would seem

to be a psychology of satisfaction with job satisfaction equal to some combination of component parts. This approach would likely be the most useful to an organization along with knowing the level of satisfaction as a quantity. The model used in this study treats job satisfaction as the sum of many parts, yielding both a relative measure of satisfaction along with a set of contributing factors.

Organizational and Job Characteristics. Pay and promotion were considered jointly both by Porter and Steers (1973) and Mobley et al. (1977). Porter and Steers (1973) report a consistently negative relationship between the levels of pay and opportunity for promotion and turnover. The data reviewed in their study indicate a clear relationship between turnover and the pay and promotion factors but, as they also point out, the question of *how* these factors effect turnover is still largely unanswered. They suggest that one approach to answering this question may be found in Expectancy Theory.

The Expectancy Theory concept accounts for at least two factors that might explain the relationship between turnover and compensation: (1) the perceived equity of rewards compared to the effort expended; and (2) the expectation that continued participation will result in attaining more desirable outcomes than any alternate behavior (Porter and Steers, 1973, p. 155). This particular model of behavior has been adopted for this study to deal with not only pay and promotions but many other variables as well.

Further review of studies involving pay and promotions by Mobley et al. (1977) revealed that since 1973, with the exception of Price (1977), the findings have shown a lack of relationship with turnover. This inconsistency with Porter and Steers (1973) may, among other things, result

from the reliance on the Job Descriptive Index (JDI) as the single measure of satisfaction with pay and promotion. Multiple measures are desirable to permit comparison of behavior of alternate satisfaction scales.

Supervision has also been studied in relation to turnover. These studies have dealt with several aspects of supervision, and from them there appears to be a central concept that principally influences turnover. The approach a supervisor takes in direct dealings with his or her subordinates seems to have the greatest affect on turnover. This particular factor has components such as supervisory feedback and job goal congruence which were identified by Porter and Steers (1973). In continuing the literature review past 1973, Mobley et al. (1977) found much weaker relationships in the more recent studies though the overall effect of satisfaction with supervision on turnover was still principally negative.

Role clarity (Porter and Steers, 1973) has also been found to be negatively associated with turnover. Role clarity deals with the ability to perceive one's place and purpose within an organization over a long period. Organizational complexity and rapid change tend to muddy conceptions of personal roles, which contributes to overall job dissatisfaction. One approach to solving this problem is to present role requirements to job applicants in order to minimize any searching for purpose by a new worker. The idea of giving a new employee some idea of what to expect leads to a second issue of met expectations.

Workers whose original expectations of a job are unmet may become dissatisfied and leave. Met expectations, however, tends to be a complex issue involving perceptions about many factors and tends to bypass

factors such as the socialization and assimilation process (Mobley et al., 1977). Although studies have shown the level of met expectations to be negatively associated with turnover, Mobley et al. (1977) contend that the concept is overly simplistic and requires further development. They seek to accomplish this in their model of turnover, which is discussed later in this chapter.

Role clarity is associated with a subdivision of job characteristics known as job content which also contains the factors of job autonomy and responsibility. These two factors were found both by Porter and Steers (1973) and Mobley et al. (1977) to have a consistently significant and negative correlation with turnover. However, Mobley et al. caution that the overall variance explained was relatively low and these two factors should not be given too much emphasis by themselves.

External Environment. The external environment reflects worker influences like the relative state of the economy and the presence of alternatives to the present employment. Mobley (1977) conceptualized that these two factors, especially alternatives, would be important variables in an individual's turnover decision process. From the few studies reviewed by Mobley et al. that pertain to this question, it would appear that the influence of the external environment is most strongly felt in developing the intention to quit rather than actually quitting. This finding has implications for this study since the principal purpose is to predict career intent.

Additional Factors. One of the goals in reviewing turnover research has been to identify turnover related factors that might serve as independent or predictor variables in some form of multivariate model of turnover. These predictors can then be related to the principal criterion:

career intent. Since the career intent variable has been substituted for actual turnover, it is highly desirable to have some assessment of the magnitude of the relationship between the two. Mobley et al. (1977) reviewed eight studies that investigated the relationship between behavioral intentions to remain or quit and actual turnover.

The results of the studies were relatively good, showing the intent-turnover relationship to be stronger than satisfaction-turnover. The highest correlation for intent and turnover was .49 ($p < .01$). Alley and Gould (1975) examined this relationship for first-term Air Force enlisted personnel and found that not only did intent have predictive ability for turnover but the correspondence between reported intent and behavior increased between the first year and the fourth year of service.

In the first year, 28 percent of the airmen indicating a positive career intent actually reenlisted and 83 percent indicating negative career intent actually separated. Fourth-year career intent responses predicted 62 percent of the reenlistments and 89 percent of the separations. Additionally, Waters, Roach, and Waters (1976) reported a correlation of .29 ($p < .01$) between tenure and intent to remain. These figures support the use of career intent as a surrogate measure of actual turnover.

Some final factors in the turnover decision examined by Mobley et al. (1977) were organizational commitment and job attachment. These two concepts may be explained as follows:

> Organizational Commitment - This concept embodies the strength of a person's identification with and attachment to a particular organization. Specifically, it is characterized by acceptance and support of an organization's goals and values along with a willingness to expend a great deal of effort on behalf of the organization and a strong desire to remain a member of the organization (Mobley et al., 1977, p. 20).

Job Attachment - Koch and Steers (1976) considered this concept as being related to organizational commitment but focusing more specifically on a person's occupation or job rather than on the organization as a whole. It is characterized by congruence between someone's real and ideal job identification with the person's chosen occupation, and a low level of desire to seek alternate employment.

Mobley et al. (1977) found that both these factors were significantly and negatively related to turnover with greater strength than satisfaction. However, the volume of published research in this area was small, and they concluded that the complexity of these constructs warrants additional research before attempting to generalize the findings. A military study that continues the research into organizational commitment is Feris and Peters (1976).

Feris and Peters identified four major categories of organizational commitment: (1) active commitment, (2) passive commitment, (3) potential commitment, and (4) no commitment. In terms of desire to seek careers outside the military, these four groups are ordered as shown above with active and no commitment anchoring the range of career intent (no commitment had the lowest intent to remain).

An interesting outcome of this research is the identification of the passively committed group. In general, the passively committed group shared all the dissatisfactions of the noncommitted group yet their career intentions were the same as the actively committed group. Feris and Peters (1976) hypothesize that the lack of stronger correlations in various studies of turnover and satisfaction may be due to the presence of passively committed members whose behavior would contradict the predicted correlation of low satisfaction with higher turnover.

The concept of passive commitment has implications for retention studies centered around Expectancy Theory. The theory says that the

lower someone's anticipated satisfaction from a job or career, the less likely they are to remain. The passively committed group would not conform to this behavioral prediction. However, both the active and passive groups were characterized by longer time in service eimplying that the golden handcuffs of military retirement were a strong influence. Thus, the effect of the passive commitment group should be minimized within this study, which concentrates on first-term officers.

A Multivariate Model. Mobley et al. (1977) conclude their report by presenting a proposal for a multivariate model of turnover. Throughout the review, they have built a case for the use of a multivariate model in order to capture the interactive effects of the factors influencing turnover. Their model also centers on individuals and the particular influence of the model variables on each person.

This study of retention of scientists and engineers follows the conclusion of Mobley et al. (1977) that a multivariate model is needed. Though the model in this study is quite different from that of Mobley et al., it too focuses on the influence of the variables and their interactions within the individual. The major portion of the rest of this chapter is primiarly an exposition on the background, development, and formulation of Expectancy Theory and the associated formal models.

The literature reviews and individual studies of turnover have provided a basis for selection of the predictor and criterion variables used in this research. The identification and development of the criterion variables are discussed in a later section of this chapter, and the selection of the 20 perdictor variables is presented as part of the methodology in Chapter III.

Expectancy Theory

One of the first considerations in approaching a problem such as a study of career intent is selecting an appropriate method of modeling a person's decision process. One method that immediately comes to mind is a standard linear regression model. This particular approach, while usable, provides no conceptual framework to guide the researcher in selecting the independent variables that will, in the end, determine the quality of the model. It seems more desirable to begin with a conceptual model that is specifically designed as an analog of motivation and behavioral choice.

Among various model of motivation is Expectancy Theory. Proposed by Vroom (1964), it began receiving considerable attention in the late 1960's. In the early 1960's, Vroom was engaged in studying problems concerning motivation in the field of industrial psychology (Vroom, 1964, Ch 1). His research indicated that while there was a great deal of research being done on motivation, there was also very little consistency among the various studies. Expectancy Theory was developed by Vroom to permit a more systematic approach to the study of motivation.

Among the researchers of the day, there was also a wide range of meanings attached to the work motivation. Vroom (1964) is very specific in his interpretation of the word: "We will use the term motivation to refer to a process governing choices made by persons or lower organisms among alternative forms of voluntary activity (p. 6)." Within the field of inquiry that involves the interrelationships between work, work roles, and motivation, Vroom (1964) has singled out three types of behavior of primary interest to researchers (p. 7).

The choices made by persons among work roles.

The extent of their satisfaction with their chosen work roles.

The level of their performance or effectiveness in their chosen work roles.

Expectancy Theory defines a functional relationship between the motives of a person and the perceived properties of work roles.

At the root of Expectancy Theory is hedonism, the concept that man acts to increase the occurrence of things that are pleasurable to him and decrease the occurrence of those things that are painful or undesirable. Drive theory, which also has a basis in hedonism, was an antecedent to Expectancy Theory. Prior to Vroom's work, Georgopoulos, Mahoney, and Jones (1957) along with other investigators in industrial psychology worked with some of the elements of Expectancy Theory; but the first formal presentation of the theory (sometimes called Instrumentality Theory) is credited to Vroom (1964).

At least 100 empirical studies (Stahl, 1978) have tested the theory in one form or another, using it to predict work related behavior such as: job effort and job performance, job satisfaction, managerial motivation, occupational choice, the importance of pay and pay effectiveness, leadership behavior and leader effectiveness, and coalition formation in organizations (House, Shapiro, and Wahba, 1974). Unfortunately, "...evidence for the validity of the theory is very mixed, and the methodology for appropriate tests of the theory is still to be determined (House et al., 1974, p. 503)."

As indicated by House et al. (1974), the overall results of research to date do not conclusively support the theory. However, there has been a noticeable lack of consistency in the application and methodology of

testing the theory. There also appears to be some variation in results based on the particular type of behavior being measured. Mitchell's (1974) review of the Expectancy Theory research to date included studies in the three major areas of behavior indicated by Vroom (1964): Occupational Preference/Choice (5 cases); Job Satisfaction (9 cases); and Job Effort/Performance (27 cases). Though the overall trend of findings tended to support the theory, the level of support for the theory appeared to decline across the studies from Occupational Preference/Choice to Job Satisfaction to Job Effort/Performance (Mitchell, 1974).

The best results were obtained in the Occupational Preference/Choice studies, including one done by Vroom (1966) himself. A later study by Parker (1974) also evidenced strong support for the Expectancy Theory model. However, it is not a simple matter of theory support being governed by the behavior studied. A major factor identified by Mitchell (1974) in the Job Effort/Performance studies was the approach taken by the researcher. There were major theoretical and methodological differences among the studies in the Job Effort/Performance group including variations of the basic assumptions proposed by Vroom (1964). Mitchell (1974, p. 9) also points out that the two studies generating the best support for the Expectancy Theory approach were also the ones that were closest conceptually to Vroom's original model.

This question of the conceptual and methodological consistency of Expectancy Theory research has been raised by several authors reviewing past studies.

> Important conceptual and methodological weaknesses may be found in virtually all empirical studies published to date... (Connolly, 1976, p. 46).

> Unfortunately, these potential theoretical improvements [provided by Expectancy Theory] have not been adequately reflected in the research (Heneman and Schwab, 1973, p. 49).

> Our empirical tests are inaccurate representations of the overall theory. Our measures do not reflect the underlying theoretical components. Our assumptions about the combinatorial properties of the theory are basically untested (Mitchell, 1974, pp. 39-40).

Mitchell (1974) also offers some concluding remarks that deal directly with the problem of how to approach Expectancy Theory research.

> How, then, do we proceed? ...Whenever the support for such a theory is less than desired, one is left with alternatives that either the measures are incorrect, the theory is inadequate, or both. Combined with these problems, the present review suggests that many of the empirical tests are based upon inaccurate theoretical representations.
>
> Because of these multiple problems, future directions for research are unclear. Changing and modifying the theory seems premature. That is, before we reject Vroom's original formulation we should correctly test it (pp. 40-41).

This philosophy has been adopted to some extent by several other researchers: Stahl (1978), Parker and Dyer (1976), Holmstrom and Beech (1973), and Vroom (1966). All of these studies attempted to follow Vroom's principal formulations and assumptions, and their results all supported the theory.

Throughout this research Vroom's model will be followed as closely as possible. There are some deviations, but they are based on research which has indicated that they are compatible with Vroom's original design and intent.

Expectancy Theory Terminology

Expectancy Theory is one of several theories stemming from the concept that

> ...the strength of a tendency to act in a certain way depends on the strength of an expectancy that the act will be followed by a given consequence (or outcome) and on the value or attractiveness of that consequence (or outcome) to the actor (Lawler, 1973, p. 45)

This field of study has developed a terminology of its own, but its usage is often inconsistent from author to author. In attempting to follow Vroom's model, it seems logical to adopt his terminology. This is made easier since Vroom (1964) was fairly explicit in defining his terms.

Outcomes. The previous statement by Lawler (1973) introduces the concept of an outcome (often called a reward). In general, an outcome (O) may be thought of as something that has occurred or come to be as a result of a person's actions or as a result of the occurrence of some other outcome. For example, a certain job carries a salary of $15,000 a year. Anyone taking the job and working hard enough to keep from getting fired would attain the outcome or reward of $15,000 a year. Depending upon how much the person desired this particular salary, his or her motivation to take the job and to expend effort doing the work would to some extent be directly proportional.

Notice that the effect on motivation need not be positive. If the $15,000 represented a cut in pay from a current job, then the person would be less inclined to take the job than otherwise. It should also be apparent that an analysis of this type would not be based on a single outcome since many factors influence job choice other than salary.

Valence. This term will be used to refer to the preference or desire for a particular outcome of whatever situation is being studied. Valences (referred to symbolically as V) may be positive or negative. An outcome has a positive valence when a person prefers attaining the outcome to not attaining it. The valence is zero if the person is indifferent to attaining the outcome or not attaining it; and the valence is negative if the person would prefer not attaining the outcome to attaining it (Vroom, 1964).

Since the Expectancy Theory model as a whole deals with motivation, Vroom was careful to distinguish valence from motive. The term motive designates a preference for a class of outcomes, whereas valence is the preference for a single outcome. Also, the term value is distinguished from valence by regarding it as the satisfaction provided once an outcome has been attained, rather than the anticipated satisfaction which characterizes valence.

There is also the question of the distinction between valence or desire and the importance of an outcome in relation to a person's decision-making process which is, of course, assumed to be strongly influenced by the person's motivations. Vroom does not appear to make a distinction between the two; thus, at this point neither does this report. However, the issue is raised again later. Finally, in addition to expressing the desire for a single outcome, preferences between outcomes can be described in terms of relative valence (Vroom, 1964).

Instrumentality. The previous discussion of outcomes implied that certain outcomes are in some way instrumental in causing the occurrence of other outcomes. The example mentioned job performance. If a person puts forth a certain amount of effort, then a certain level of performance

will result. Thus, performance is an outcome of the act of expending effort. If the level of performance is sufficient for the person to retain the job, then he or she will continue to collect $15,000 a year. In this way, the outcome performance is instrumental in causing the outcome $15,000 a year.

The perceived association or correlation between the two outcomes is called the instrumentality (I) of one outcome (performance) for the attainment of the other (salary). The original theory makes a specific point of the potential for two outcomes to be negatively associated; thus, instrumentalities can range in value from -1 to +1 (Vroom, 1964; Parker, 1974; Graen, 1969; Connolly, 1976). Very simply, then, instrumentality is an outcome-to-outcome association.

Expectancy. Expectancy (E) is an action-to-outcome association. Vroom (1964) defines this as a momentary belief about the likelihood that a particular act will be followed by a particular outcome. People are not only influenced by their preferences for certain outcomes but also by the degree to which they feel the outcome is likely to occur. In terms of the previous example, job effort was described as an action and performance as an associated outcome. Expectancy would measure the strength of the perceived probability that putting forth a certain amount of effort would result in achieving a specific level of performance.

Vroom (1964) also described expectancies in terms of their strength. If an outcome is perceived by the individual as absolutely certain to follow a particular action, a maximal strength expectancy exists. On the other hand, if it is believed that an outcome cannot possibly follow a particular action, then the strength of the expectancy is zero. In terms

of a value scale, expectancies are usually mesaured as a probability ranging from 0 to +1 (Vroom, 1964; Graen, 1969; Mitchell and Biglan, 1970; Parker, 1974).

It is important to note the distinction that Vroom makes between an expectancy and an instrumentality. Expectancy is a perceived probability ranging from 0 to +1 while instrumentality is a perceived association or correlation ranging from -1 to +1.

Vroom's Models

Vroom (1964) presents his concepts using two models. The first, Proposition 1, is for the measurement and prediction of the valence of outcomes and is referred to as the valence model by Mitchell (1974).

> Proposition 1. The valence of an outcome to a person is a monotonically increasing function of the algebraic sum of the products of the valences of all other outcomes and his conceptions of its instrumentality for the attainment of these other outcomes (Vroom, 1964, p. 17). Symbolically this may be represented as follows (adapted from Vroom, 1964, and Mitchell, 1974):

$$V_j = f\left[\sum_{k=1}^{n}(V_k I_{jk})\right]$$

where

V_j = the valence of outcome j

V_k = the valence of outcome k

I_{jk} = the perceived instrumentality of outcome j for the attainment of outcome k

n = the number of outcomes

Vroom's second model, Proposition 2, measures and predicts the force toward behavior. Mitchell (1974) designates this the behavioral choice

model, a description which is quite apt for this study and which for simplicity's sake will be referred to as the choice model.

> Proposition 2. The force on a person to perform an act is a monotonically increasing function of the algebraic sum of the products of the valences of all outcomes and the strength of his expectancies that the act will be followed by the attainment of these outcomes (Vroom, 1964, p. 18). Symbolically (adapted from Vroom, 1964, and Mitchell, 1974):

$$F_i = f\left[\sum_{j=1}^{n}(E_{ij}V_j)\right]$$

where

F_i = the force on the individual to perform act i

E_{ij} = the strength of the expectancy that act i will be followed by outcome j

V_j = the valence of outcome j

n = the number of outcomes

Usefulness of Expectancy Theory in Occupational Choice. The principal purpose of this research is to study the turnover problem among scientists and engineers via a measure of career intent. The decision to stay in the Air Force or to separate is one aspect of a class of behavior known as occupational choice, which is discussed at some length by Vroom (1964, Ch 4). He categorizes the behavior of a career choice into three distinct elements: occupational preference, occupational choice, and occupational attainment. Vroom (1964) describes these three categories as follows:

> Occupational Preference - The occupation with the most positive valence.
>
> Occupational Choice - The occupation toward which there is the strongest positive force.

Occupational Attainment - The occupation in which the person is a member.

Occupational preference is readily measured by the valence model (Proposition 1). The choice model (Proposition 2) is especially well-suited for predicting occupational choice. However, the jump from choice to attainment is often bridged by factors of which a person has no prior knowledge or influence over (Vroom, 1964). This will not present any difficulties in this study since our goal is prediction of occupational choice.

In Parker's (1974) study of turnover in the form of retirement, he reviews (pp. 32-40) seven studies of turnover that utilize Expectancy Theory or a similar model: Sheard, 1970; Mitchell and Knudsen, 1973; Huber, Daneshgar, and Ford, 1971; Vroom, 1966; Pieters, Hundert, and Beer, 1968; Dunnette, Arvey, and Banas, 1973; and Mitchell and Albright, 1972. All of the studies supported the Expectancy Theory-type approach although at least two of the studies had results that differed from Mitchell's (1974) conclusions regarding the need for consistency with Vroom in applying the model.

Both Sheard (1970) and Mitchell and Knudsen (1973) found that the valence measure was relatively weak in its effect on the overall power of the model, and that instrumentality was the principal component effecting predictions. Mitchell and Knudsen did go on to say that the valence component should be retained until further research could be done. This particular question brings up the subject of just how much of Vroom's original work is still followed in current Expectancy Theory research.

Developments in Vroom's Theory

Wahba and House (1974) and Reinharth and Wahba (1975) reported that there have been at least three major developments in Expectancy Theory since Vroom set forth the original model.

Identification of first- and second-level outcomes;
Use of both intrinsic and extrinsic outcomes;
The distinction between Expectancy I and Expectancy II.

These developments raise important theoretical and methodological considerations affecting the implementation of the model and are discussed in some detail. In addition, some other theoretical and methodological questions that are not considered in the previous three developments are addressed:

Expectancy Theory as a within-person model;
Combinatorial properties of the model;
Identification and selection of the outcomes.

First- and Second-level Outcomes. Studying the valence and choice models originally presented by Vroom may leave some doubt in the reader's mind as to how outcomes are identified and selected for use with each model. Without specifically stating the relationship when he presented the two basic models, Vroom used the models in such a way that the valences of the outcomes in the choice model are implied to be generated by the valence model. This relationship has been expressed symbolically (shown below) by Mitchell and Albright (1972) and Nebeker and Moy (1976) in a combined or general force model, which is referred to in this report as the general model. Although this appears to be a straightforward

substitution, various studies reviewed by Mitchell (1974) did not use this progression of second- to first-level outcomes and valences.

$$F_i = f\left[\sum_{j=1}^{m} E_{ij}\left(\sum_{k=1}^{n} I_{jk}V_k\right)\right]$$

where

F_i = force toward act i

E_{ij} = the expectancy or probability that act i will result in outcome j, where j is a first-level outcome

I_{jk} = the perceived instrumentality of outcome j for the attainment of outcome k, where j is a first-level outcome and k is a second-level outcome

V_k = the valence of the second-level outcome k

m = the number of first-level outcomes

n = the number of second-level outcomes

Mitchell and Biglan (1971) describe a first-level outcome as one which the investigator is interested in predicting. The second-level outcomes are events to which the first-level outcomes are expected to lead. Recalling the earlier example of the $15,000-a-year salary and its relationship to job performance, job performance would be a first-level outcome and the $15,000-a-year salary would be a second-level outcome since a certain level of performance would lead to keeping the job and attaining the $15,000 a year.

In this example, the researcher would probably be interested in predicting the level of job performance that a person would be likely to exhibit. The relationships between valence, instrumentality, expectancy, and first- and second-level outcomes can be illustrated pictorially as shown in Figure 1. Note that the valences associated with each type of outcome may also be referred to as first-level and second-level.

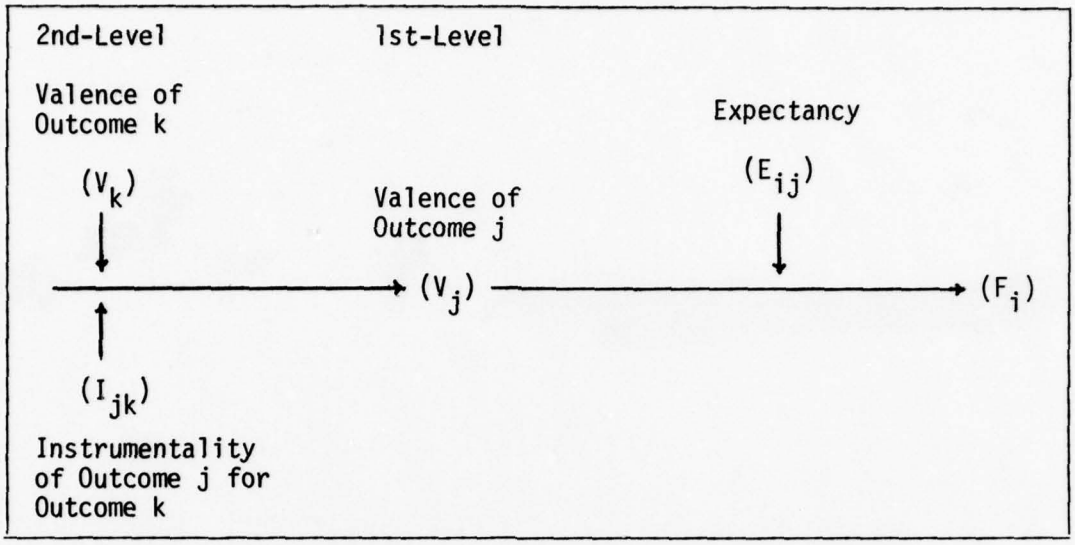

Figure 1. General Model of Motivation or Force, Adapted from Heneman and Schwab (1973, p. 44)

The origin of this distinction between outcomes is attributed to Galbraith and Cummings (1967) by House, Shapiro, and Wahba (1974). Recent articles and papers by Heneman and Schwab (1973), Connolly (1976), Parker and Dyer (1976), and Stahl (1978) have used this classification of outcomes without preamble or reference; thus, it is reasonable to assume that they are accepted as part of Expectancy Theory terminology.

Intrinsic and Extrinsic Outcomes. Reviewing Vroom (1964), Mitchell concluded:

> The implication is that only externally mediated rewards, such as pay or promotions, should be included. Intrinsic rewards such as 'feelings accomplishment' should be omitted according to Vroom, or at the very least considered separately (p. 17).

Gilmer and Deci (1977) agree and state the "Vroom's model is concerned exclusively with extrinsic motivation." This issue has been raised because many authors (Galbraith and Cummings, 1967; Lawler, 1970;

Mitchell and Albright, 1972; House, Shapiro, and Wahba, 1974; Mitchell, 1974; Parker and Dyer, 1976; and Stahl, 1978) feel that intrinsic rewards have a definite place in the Expectancy Theory concept.

As with other aspects of Expectancy Theory research, there is some variation in the literature concerning what constitutes intrinsic and extrinsic outcomes. In general, extrinsic rewards or outcomes accrue to a person as a result of the operation of some outside agency such as a person's employing organization. This class of outcomes includes such things as pay, promotions, and other material benefits. On the other hand, intrinsic outcomes are generated and acquired by a person from within. They can often be anticipated to result from certain behavior and are a natural consequence of that behavior (Galbraith and Cummings, 1967). A sense or feeling of pride and accomplishment in one's work is an example of this type reward.

This tends to explain why intrinsic and extrinsic rewards are often referred to as internally mediated and externally mediated, respectively. If intrinsic and extrinsic rewards or outcomes are thought of as needs, then this distinction is somewhat similar to the distinction between lower and higher order needs in the Maslow hierachy. The physiological, safety, and social needs tend to be extrinsic; and the self-esteem and self-actualization needs are intrinsic (Gilmer and Deci, 1977, Ch 8).

Opinions differ over how intrinsic outcomes should be incorporated into the model. Mitchell (1974) postulates that intrinsic (internally mediated) rewards produce expectancies close to 1.00 and applies the models to them as a separate case. Contrasted to this is Lawler's (1970) report of Atkinson (1964) and McClelland (1961) which suggests that

"...under some conditions the highest intrinsic motivation may result when effort is seen to have only a 50-50 chance of leading to good performance (p. 233)."

Their reasoning pursues the idea that feelings of achievement and accomplishment are greater and produce the highest motivation when the probability that effort may not lead to the desired performance is greater than .5 (i.e., expectancy < .5). For the intrinsic rewards it is felt that the closer expectancy approaches 1.00, the less likely a person will derive a feeling of accomplishment from the performance that results from his efforts.

This concept is at odds with that of the choice and general models which predict that motivation or force is directly proportional to expectancy throughout the range from 0 to +1. In addition, Lawler (1970) proposes two distinct models for the two types of outcomes. For both researchers (Mitchell, 1974, and Lawler, 1970), the use of two separate models is proposed, one for each type reward; however, the underlying rationale and structure of the models vary considerably.

The question of how to incorporate intrinsic outcomes into an Expectancy Theory model was addressed and tested by Parker (1974). Parker divided his outcomes into intrinsic and extrinsic and tested the model separately for each group of outcomes. His method of testing was conceptually the same as Vroom (1966). Parker measured the force toward retirement and the force for staying on active duty (sample population was Naval officers). From this he took the larger of the two forces as a predictor of actual status (retired or active) which was known.

Using intrinsic outcomes, the model correctly classified 64.2 percent of the respondents. The percentage correct for extrinsic outcomes

was 61.6. Both these percentages were significant ($p < .01$), and the consistency of the results led Parker to conclude that "...the hypothesis that intrinsically mediated outcomes alone result in more accurate discriminations than extrinsically mediated outcomes is not supported (p. 114-115)." Throughout the rest of his analysis, the Expectancy Theory model was tested using a combined set of intrinsic and extrinsic outcomes.

Going back to the work of the author of Expectancy Theory, an examination of the outcomes that Vroom used in a 1966 study reveals some that appear strongly intrinsic. Of the 15 outcomes used in predicting occupational choice of graduate students, at least 6 imply some concept of intrinsic reward (p. 217):

1. Chance to learn new things;
2. Chance to benefit society;
5. High prestige and social status;
10. Friendly and congenial associates;
11. Working as part of a team;
15. Chance to make a contribution to important decisions.

While this finding, combined with Parker's work, is hardly conclusive, it does lend support to using a set of outcomes that include both intrinsic and extrinsic outcomes, which is the approach taken in this study.

Expectancy I and Expectancy II. In an effort to refine the original concept of expectancy as defined by Vroom (1964), Campbell, Dunnette, Lawler, and Weick (1970) have divided it into two separate components: expectancy I and expectancy II. The first is a person's estimate of the chances of his or her actually being able to accomplish a task or exhibit a performance. This estimate takes into consideration a person's

abilities and the surrounding external situation resulting in a subjective measure of the probability that the task can be accomplished at all. This is referred to by Campbell et al. (1970) as expectancy I (p. 346).

Expectancy II is a person's subjective probability estimate of the degree to which first-level outcomes or rewards are contingent upon his performance. Vroom (1964) implies both of these concepts in his action-outcome definition of expectancy. Apparently this distinction was not conceived or considered particularly significant by Vroom (Campbell et al., 1970). However, for practical use within an organization, Campbell et al. felt the separation essential.

House, shapiro, and Wahba (1974) took up this issue citing Campbell et al. (1970) and reported the following as the definition of the two expectancies:

> [Campbell et al., 1970] extend the model further by distinguishing between the two types of expectancies: Expectancy I—concerning whether or not the individuals will actually accomplish first level outcomes such as work goal accomplishment; and Expectancy II—concerning whether or not achievement of first level outcomes will actually be instrumental in the attainment of second level outcomes. This distinction appears to be used rather consistently by recent investigators.... Expectancy II is similar to, but not identical with Vroom's construct or instrumentality (p. 484).

The definition of expectancy I is consistent with Campbell et al., but the attribution of the above definition of expectancy II to Campbell et al. (1970) is without support.

Although House, Shapiro, and Wahba's (1974) concept of expectancy II cannot correctly be attributed to Campbell et al., it can be dealt with as a separate concept. House, Shapiro, and Wahba use expectancy II as a replacement for Vroom's instrumentality; however, the two are not

synonymous. Instrumentality is a form of perceived correlation ranging from -1 to +1, and expectancy II is a perceived probability ranging from 0 to +1. In spite of the difference, they are both used operationally in various studies to measure the association between first-level and second-level outcomes.

The original definition of expectancy II by Campbell et al. has received little support in the literature. The tendency in recent studies has been to label the probability of a first-level outcome leading to a second-level outcome as expectancy II. As a result, a division can be seen between the various authors and researchers in terms of the use of perceived association (-1 to +1) versus perceived probability (0 to +1), which are generally referred to as instrumentality and expectancy II, respectively. Table II categorizes this distinction by researchers.

Table II

Classification of Research by Type of First-Level and Second-Level Outcome Association Used

Perceived Correlation -1 to +1 (Instrumentality)	Perceived Probability 0 to +1 (Expectancy II)
Vroom (1964)	Porter and Lawler (1967)
Vroom (1966)	Lawler (1970)
Galbraith and Cummings (1967)	House, Shapiro, and Wahba (1974)
Graen (1969)	Wahba and House (1974)
Campbell et al. (1970)	
Mitchell (1972)	
De Leo and Pritchard (1974)	
Reinharth and Wahba (1975)	
Parker and Dyer (1976)	
Connolly (1976)	

Note that the classifications in Table II are by concept rather than the author's use of the terms instrumentality and expectancy II. A case in point is Reinharth and Wahba (1975). They used an instrumentality-type (-1 to +1) scale but measured the positive and negative portions of the scale separately as probabilities and called the combined result expectancy II. Lawler (1970) uses the concept of perceived probability and labels it essentially as such, avoiding the use of either of the two terms.

Despite the variations, there does appear to be a trend in terminology. In general, a researcher attempting to follow Vroom's model will likely use the terms valence, instrumentality, and expectancy; otherwise, if the first-level and second-level outcome association is treated as a probability, one is more likely to find the terms valence, expectancy I, and expectancy II. Within this study, both Vroom's terminology and concept of instrumentality are used.

Expectancy Theory as a Within-Person Model

Mitchell (1974) found that out of 27 empirical job effort performance studies he reviewed none of them used a within-person analysis in their tests of Expectancy Theory. Essentially, within-person testing means that all the elements of the model are first combined to produce a force score for each individual. In addition, data must be collected for a range of alternatives available to the individual to choose from. The prediction of a person's choice is made by selecting the alternative for which the relative force is greatest (Nebeker and Moy, 1976).

Vroom (1964) took a similar position in his discussion of the theory when he said,

> It is also assumed that people choose from among alternative acts, the one corresponding to the strongest positive (or weakest negative) force. This formulation is similar to the notion in decision theory that people choose in a way that maximizes subjective expected utility (p. 19).

He made this statement following the presentation of Proposition 2, and it clearly supports a within-person approach (Parker, 1974; Mitchell, 1976).

The alternative to within-person is across-person. In an occupational choice context, an across-person test would involve calculating the force score of a person for staying in the Air Force. The force would then be correlated with a criterion such as a career intent question across all subjects in the study to see if high force indicated a high career intent. The problem with this is that a person does not choose between alternatives by comparing his force for only one of those alternatives with the forces of other individuals for that same alternative (Nebeker and Moy, 1976).

Another consideration is that an across-person test of the predictive power of Expectancy Theory makes an implicit assumption that individuals having desires, perceived associations, and expectancies of equal strength will give the same responses on scales designed to measure these quantities. Past studies of individuals with similar perceptions have shown that this is not the case (Guion, 1965; Nunnally, 1967). The result is that such a test of Expectancy Theory will quite possibly lower the predictive power of the model through no fault of theory (Parker, 1974).

Combinatorial Properties of the Model

Some of the research into Expectancy Theory has focused on the validity of the specified relationship between valence, instrumentality, and expectancy. More specifically, the second-level valences are multiplied by their corresponding instrumentalities. The resulting products are summed to yield a first-level valence, which is then multiplied by an expectancy to yield a force score. This relationship has raised two basic questions: Whether it is proper to specify a strict mathematical relationship for these particular measures, and whether the relationship is truly multiplicative.

Most Expectancy Theory research appears to use similar measurement methodologies. Valence and instrumentality are usually measured with a range of values such as a Likert-type scale. In this context, Mitchell (1974) described these measures as *nonratio and even noninterval*. That leaves the common measures of valence and instrumentality as interval, at best (Nebeker and Moy, 1976), and perhaps no better than ordinal.

Hackman and Porter (1968) were the first to summarize the problem; using a model similar to the choice model they concluded:

> Although there are zero values on both the E and V questionnaire scales, it is clear that these measurement procedures do not meet the criteria for ratio scales. Thus, it is not legitimate to claim that the $\Sigma E_i \times V_i$ predictor is a psychometrically valid measure of the 'motivation' of individual subjects. Instead, the predictor is viewed as a numerical score which, given the measurement and arithmetic operations employed to obtain the score and the theory from which the operations were derived, should reflect gross differences in the motivation of subjects to work hard. Thus, the procedures used follow Comrey's (1951) 'practical validity criteria' rather than 'fundamental-measurement criteria.' As Comrey (1951) and Hays (1963) note, such procedures are reasonable, as long as the scores are substantively meaningful on extramathematical grounds and so long as the scores do in fact relate to the criterion variables of interest (p. 420-421).

A strict interpretation of this issue implies that these motivation, or force scores, can be used for predictive purposes, but they should not be used in an attempt to validate the multiplicative nature of the model (Mitchell, 1974).

Schmidt (1973) continued the investigation into this problem. He constructed two artificial sets of data which included measures of expectancy, valence, and effort and which were statistically equivalent to empirical data. He then formed an additive and a multiplicative model for effort (Effort = V x E and Effort = V + E). These models were tested under various linear transformations of both the valence and expectancy measures. The resulting predictive accuracy of both models for effort varied greatly with the particular transformation. In addition, the correlations of the multiplicative model with effort under these transformations appeared to be arbitrary. This led Schmidt (1973) to conclude that "...a meaningful test of the multiplicative expectancy-valence models is not possible using the measures and operations employed by researchers in this area to date (p. 249)."

Connolly (1976) reviewed this portion of Schmidt's work and felt that the conclusion was somewhat harsh. Connolly analyzed Schmidt's findings and concluded that the measurement errors necessary to produce Schmidt's results would be unlikely in practice. Connolly (1976) retired the issue with the statement: "Given some caution with regard to the scaling issues Schmidt raises, the simple models and measures apparently will suffice for the present approximate level of research precision in this area (p. 45)."

Schmidt's arguments emphasized variations of the true zero point of the scales as the major cause of the problems. One of his tests consisted

of adding a constant to each of the components in the multiplicative model, then pointing out the resultant changes in the correlation between the force score and the criterion. Nebeker and Moy (1976) report that this analysis is based on the logic of normative measurement (Cattell, 1944) and the use of an across-person analysis.

The result is that

> ...if a within-subject analysis is performed, the ordinal properties of the force are invariant within a subject and, therefore, the predictions are not affected to any large degree by the addition of a constant. What this implies is that, if within-subject comparisons are made, Schmidt's criticisms would have little impact (Nebeker and Moy, 1976).

Mitchell (1974) agrees and says:

> Schmidt also points out that without a rational zero point and a true ratio scale, scores for specific subjects vary some amount from a 'true score.' To the extent that this variance is a constant, then a within subjects analysis will again help to remedy the problem (p. 24).

There remains one other issue of interest in this area. The instrumentality-valence products ($I_{jk} \times V_k$) are simply summed to produce a first-level valence. This method implicitly applies an equal weight in the summation to all the products. Lawler and Porter (1967) and Mitchell and Pollard (1973) used a multiple regression model with the instrumentality-valence products as independent variables. With this approach the products are weighted separately, and the results tended to show higher correlation coefficients though little else has been done to validate the findings (Mitchell, 1974).

Multiple regression is typically an across-person model and leaves this approach open to criticisms presented previously. However, the

question of the weighting of instrumentality-valence products deserves further consideration and is discussed again later.

Identification and Selection of Outcomes

The task of selecting relevant outcomes for use with an Expectancy Theory model is not entirely straightforward. Mitchell and Biglan (1971) suggest that the subjects should generate their own list of outcomes rather than use a standard list for all subjects developed by the researcher. This conclusion by Mitchell and Biglan resulted from a review of Galbraith and Cummings (1967). Mitchell and Biglan felt that this would be a better approach than the methodology of Galbraith and Cummings which used a rather limited a priori list developed by the researchers.

Mitchell and Biglan (1971) also allowed for the inclusion of outcomes other than those relevant to the subject. They said, "...outcomes not perceived by the individual as resulting from the first level outcome may be included in the equation, since their instrumental value will be zero; and they will, therefore, not degrade the prediction of the valence of the first level outcome (p. 39)." This would imply that the use of a long list containing the majority of the outcomes likely to be relevant to one or more of the subjects based on some form of interview or pretest would be an acceptable approach to the problem.

Unfortunately, the inclusion of nonrelevant outcomes (implying a large number) has, in practice, reduced the predictability of the theory (Mitchell and Biglan, 1971); Mitchell, 1972). This might be explained, in part, by the concept that choices are usually made on the basis of a small number of variables (Miller, 1956; Slovic and Lichtenstein, 1971).

Also, Parker (1974) tested this question of quantity and found that when the number of outcomes reduced was from his original 25 to the 8 most important (as measured by subject self-report), the accuracy of prediction of occupational choice increased from 62.6 percent to 68.3 percent. This difference was significant at the .01 level.

One final point is the issue of the effect of including negative outcomes on the predictive ability of the model. A need for this type outcome has been indicated by Hackman and Porter (1968), Mitchell (1974), Reinharth and Wahba (1975), Connolly (1976), and Matsui and Ikeda (1976). However, in spite of their arguments for inclusion of negative outcomes, their inclusion appears to have little, if any, effect on the predictive ability of the model (Hackman and Porter, 1967; Parker, 1974; Reinharth and Wahba, 1975). In view of this, no distinction will be made in this study between positive and negative outcomes during the selection process.

Measurement of Valence. Parker's comments on importance raise another issue. There is some ambiguity in the literature concerning the concept of valence. We have defined it in accordance with Vroom's original proposition as a measure of anticipated satisfaction; however, when Vroom (1966) tested his theories, he measured valence in terms of importance (p. 216). This raises the question of whether desirability is essentially equivalent to importance (Connolly, 1976). Parker (1974) tested this specifically by asking both an importance question and a desirability question about each outcome. He found that the overall correlation between valence (as desirability) and importance was .118 ($p < .01$). His conclusion: "These correlations suggest that although there is a slight relationship between valence and importance, it is so small that the hypothesis of independence is essentially correct (p. 103)."

In addition to the empirical evidence, there is also some intuitive appeal to this conclusion. One can conceive of cases where an outcome would be highly desirable but not particularly important to the decision process. For example, a particular job might offer the opportunity to belong to an exclusive social club. For many people this might be highly desirable but would have little impact on the decision of which job to take given other differences such as salary. In the case of an Air Force communications officer with a Masters degree, the opportunity for additional education might be highly desirable of itself but relatively unimportant when compared to the possibility of an unaccompanied one-year tour of duty.

Reflection on the studies discussed to this point seems to indicate some interrelationships among the various statements regarding outcomes and their place in the decision process as modeled by Expectancy Theory. A smaller number of outcomes appears to provide better predictive power than a large number provided they are tailored to the individual. This is supported by Miller's (1956) and Slovic and Lichtenstein's (1971) concept of limited rationality restricting the information processing capacity of people in decision-making situations. The suggestion of a self-reported or individually tailored outcome set is aligned with the idea of importance of outcomes. Thus, for the researcher, the optimum method of selecting outcomes would appear to be to identify and use the outcomes for each subject that weighed most heavily in his or her decision-making process (Parker, 1974, p. 112-113). Mitchell (1974) indicates that in practice individually tailored outcome sets are extremely difficult to implement. This study uses a different approach described in Chapter III.

Criterion Variables

> The important feature of the model, as far as we are concerned, is its view of behavior as subjectively rational and as directed toward the attainment of desired outcomes and away from aversive outcomes (Vroom, 1964, p. 276).

In accord with Vroom's intent, it is felt that Expectancy Theory is of principal use in predicting behavioral intentions and choices. Accordingly, the criterion variables were selected for (1) their usefulness in measuring attitudes and intentions of interest to local researchers and to the Air Force, and (2) their consistency with the particular predictive abilities of Expectancy Theory.

Career Intent. Within this report the terms career intent and turnover are used somewhat interchangeably even though they are not the same. Turnover involves the actual separation of personnel from the Air Force. Given the small number of scientists and engineers separating at any one time and the continuous nature of the process, it was not possible to conduct a study of this type that actually measured turnover. Instead, a surrogate measure had to be adopted.

Two studies, one civilian (Waters, Roach, and Waters, 1976) and one Air Force (Alley and Gould, 1975), examined expressed career intent versus turnover in a longitudinal fashion and found that between 60 and 75 percent of the subjects acted in accordance with their expressed intentions. In addition, the Air Force study indicated that the correlation between expressed intent and observed behavior rose considerably between the first year of service and the fourth year. Alley and Gould (1975) found that a career intent measure correctly predicted 71 percent of the overall reenlistments and separations as indicated in the first year. By the

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Career Intent. Within this report the terms career intent and turnover are used somewhat interchangeably even though they are not the same. Turnover involves the actual separation of personnel from the Air Force. Given the small number of scientists and engineers separating at any one time and the continuous nature of the process, it was not possible to conduct a study of this type that actually measured turnover. Instead, a surrogate measure had to be adopted.

Two studies, one civilian (Waters, Roach, and Waters, 1976) and one Air Force (Alley and Gould, 1975), examined expressed career intent versus turnover in a longitudinal fashion and found that between 60 and 75 percent of the subjects acted in accordance with their expressed intentions. In addition, the Air Force study indicated that the correlation between expressed intent and observed behavior rose considerably between the first year of service and the fourth year. Alley and Gould (1975) found that a career intent measure correctly predicted 71 percent of the overall reenlistments and separations as indicated in the first year. By the

fourth year the correct predictions had reached 61 percent for reenlistment and 93 percent for separation yielding an overall rate of 88 percent, based on a sample of 12,908.

In a similar study by Shenk and Wilbourn (1971) of Air Force junior officers, 89 percent of those that expressed an intention to remain in the Air Force did so over the five-year span of the study. For those officers expressing an intention to leave the service, 95 percent did so over the same period; thus, it was possible for the authors to conclude "...that an individual is fairly consistent in his expressed career intent and his actual career decision (p. 2)." These findings indicate that career intent is an acceptable analog of turnover and is suitable for use in this study.

Job Satisfaction. One of the most common uses for the valence model is prediction of job satisfaction (Mitchell, 1974; Reinharth and Wahba, 1975). Thus, a job satisfaction criterion was selected to facilitate study of the valence model alone. Based on the results of past utilization, Hoppock's job satisfaction measure appeared ideally suited for this survey.

McNichols, Stahl, and Manley (1978) reviewed four empirical studies that used the Hoppock measure and found that: "The measure performs well when examined in terms of its distribution, construct, convergent, and concurrent validities, and reliability (p. 6)." In addition, the measure appears to work well across many types and categories of sample populations.

Institution-Occupation Orientation. For some time now, job satisfaction has been considered a primary predictor of turnover. Some recent research has proposed job attachment or organizational commitment

as a predictor of turnover equal to or better than job satisfaction (Lassiter and Proctor, 1976; Koch and Steers, 1976; Feris and Peters, 1976). This concept of identification with and attachment to an organization has also become an issue of interest to the Air Force.

Often referred to as institution-occupation orientation, the Air Force is concerned with the extent that its members identify with the Air Force as a profession as opposed to simply considering it as just another job. Stahl, Manley, and McNichols (1978) tested a measure of this issue in the second Quality of Air Force Life survey. The measure used was an outgrowth of Gouldner's (1957) cosmopolitan-local research.

Gouldner classified people by whether they identified themselves primarily with their employing organization (local) or with some other external referent group (cosmopolitan). If an engineer thought of himself principally as an engineer rather than as a member of his employing organization, he would be considered to have a cosmopolitan orientation; whereas, an Air Force engineer that considered himself first and foremost an Air Force officer would be characterized as local.

The question of how military members see themselves has been studies by Moskos (1977) resulting in an institution-occupation model which is closely related to the cosmopolitan-local construct. "Moskos (1977) characterized the occupational orientation by self-interest and marketplace values, whereas the institutional orientation is characterized by self-sacrifice and dedication (Stahl, Manley, and McNichols, 1978, p. 2)."

The concept was tested with a measure consisting of eight questions based on Gouldner's work. Analysis of the components indicated that

they measured two independent dimensions with four questions each. Table III shows the results of a principal component analysis of the eight questions comprising the measure.

Table III

Factor Loadings: Institution-Occupation Questions[a]

Question	Factor 1 Institution	Factor 2 Occupation
6. Discipline in the Air Force	.68[b]	.10
7. Comparable Job Opportunities	.02	-.65
8. Desirability of Living on Base	.21	-.61
9. Mission Accomplishment	.61	.14
10. National Security	.66	.05
11. Need More Supervision	.62	.02
12. Nonjob-related Activities	-.02	.53
13. More Equity as Civilian	-.09	.73

(Adapted from Stahl, Manley, and McNichols, 1978, Table 5)

[a]Sample size = 10,687
[b]Underscore identifies question with corresponding factor.

Results of applying the model indicated career intent (ci) and job satisfaction (js) to be positively correlated with institution (r_{ci} = .36; r_{js} = .24; p < .001) and negatively correlated with occupation (r_{ci} = -.39; r_{js} = -.32; p < .001) (Stahl, Manley, and McNichols, 1978).

Expectancy Theory has never before to the knowledge of this writer been applied to institution-occupation orientation; thus, the anticipated results must be specified on an a priori basis. There appears to be two possible alternatives. First, a preference for an Air Force career would seem to imply an organizational affiliation. Considering some of the

requirements imposed by the military, this preference might also indicate more of a devotion to the organization than to the material desires of self. The implication, then, is that individuals with a desire for an Air Force career will tend to exhibit a greater institution-orientation score than those with a lesser desire for such a career.

Subjects in this study that tend to place self-interest above organizational attachment would be expcted to exhibit a stronger desire for or tendency toward a civilian career in conjunction with a higher level of occupation orientation. These orientation hypotheses are principally based on the concept that civilian life has more to offer a scientists or engineer which, in turn, is suggested by the high attrition rate in these career fields. Second, the actual forces guiding these individuals may be quite different from those proposed here and, if so, it is hoped that the results from testing the model will give some indication of what motivations are actually at work.

One final consideration is which predictor, valence or force, should be used in predicting the orientations. The concepts of institution and occupation orientation do not seem to fit into a choice category but, instead, appear to be a preference in the same manner as job satisfaction. Based on this observation, the orientation measures will be testing using first-level valences instead of force scores.

Hypotheses

The preceeding sections of this chapter describe the career choice model and some of the implications and assumptions surrounding it. This final section presents the hypotheses whose testing will guide the methodology and procedures throughout the operational portions of this

research. These hypotheses have resulted from inferences and conceptual questions raised in the literature and from the opinions and beliefs of this writer.

One of the basic philosophies guiding this research is a desire to formulate and test the Expectancy Theory model in a manner as consistent with Vroom's theory as possible. Thus, the hypotheses tested are formed with this goal in mind. The survey instrument used in this research was designed to generate data that supports testing of Vroom's (1964) occupational preference and occupational choice applications of Expectancy Theory.

The hypotheses are tested on the basis of a within-person methodology. To be consistent with the requirements for this type analysis, as discussed in Chapter II, it is necessary to deal with career choice as a choice between specific alternatives for each individual. It is also necessary that the form of the alternatives be consistent with the use of a correlation to measure the actual association between the predictor and the career intent criterion. There are two career choices (i.e, Air Force and civilian) and a predictor for each; consequently, the career preference will be determined similar to Parker (1974) by taking the difference between the Air Force predictor and the civilian predictor. The resultant single preference score can be used in the correlation with a single criterion.

Hypothesis 1a. There is a significant, positive relationship between the difference of the two first-level valences (preference for Air Force and civilian) and the respondent's intention to separate or remain in the Air Force (career intent criterion).

Hypothesis 1b. There is a significant, positive relationship between the difference of the two overall force scores (choice of Air Force and civilian) and the career intent criterion.

Based on the reported relationships between career intent type measures and actual turnover, it appears reasonable to assume that a career intent measure corresponds to Vroom's concept of occupational choice, therefore:

Hypothesis 1c. The use of the choice model (overall force scores) produces a significantly higher degree of association with the career intent criterion than the valence model (first-level valences).

Vroom also described the application of Expectancy Theory to job satisfaction using both the valence and choice models. Later empirical studies have consistently described job satisfaction in terms of the valence model; a methodology which has been adopted here.

Hypothesis 2a. There is a significant, positive relationship between the first-level valence for Air Force and the Hoppock job satisfaction criterion.

Hypothesis 2b. The use of the valence model produces a significantly higher association with the Hoppock job satisfaction criterion than the choice model.

There are no published studies, to the knowledge of this writer, testing the measures of institutional and occupational orientation in relation to Expectancy Theory; thus, these tests are specified a priori. The concept of the institution measure is one of identification with and dedication to the organization. It is reasonable to expect from this that the institution measure would exhibit a positive association with career intent and, correspondingly, with first-level valence for

the Air Force and a negative association with the civilian predictors. Conversely, occupation scores provide a measure of the strength of self-interest and marketplace values. It is anticipated that the occupation measure is directly related to the civilian predictors and inversely related to career intent and job satisfaction.

Hypothesis 3. The institution-orientation measure is positively associated with the first-level valence for the Air Force and negatively associated with the first-level valence for a civilian career.

Hypothesis 4. The occupation-orientation measure is positively associated with the first-level valence for a civilian career and negatively associated with the first-level valence for the Air Force

A review of the hypotheses shows that the relationships between the Expectancy Theory and the career intent criterion have received greater emphasis than the other criterion. This skewness is intentional and resulted from Military Personnel Center (MPC) contact that indicated that the most pressing issue within the scientific and engineering career fields is the high rate of turnover. As a result, the major emphasis in this study is on the career intent criterion with only primary aspects of the other three criterion variables presented.

III. Methodology

Objectives

As indicated in Chapter I, this research project has two principal goals: (1) identifying factors of turnover within the Air Force scientific and engineering career fields, and (2) testing the suitability of Expectancy Theory as a vehicle for accomplishing (1). In designing the research and methodology, three enabling objectives were developed to accomplish the primary goals.

1. Identify a sample population.

2. Identify the outcomes relevant to the sample and design a survey instrument incorporating these outcomes to measure the components of the Expectancy Theory model in accordance with the precepts set forth in Chapter II.

3. Analyze the data generated by the survey instrument in a manner to allow testing of the hypotheses and production of additional data as required by principal goal (1).

Overall Design

As discussed in Chapter II, the best approach to implementing Expectancy Theory would be to design the study to allow prediction of choices when the results are already known (Vroom, 1966). In the case fo Air Force versus civilian career choices, this would present the researcher with a straightforward, dichotomous design: calculate the two career forces and compare them to the person's career choice which would be indicated by whether he or she had separated or not.

While this approach is seemingly ideal, it requires a longitudinal study spread over several years. The required amount of time was not available for this study, and a concurrent approach had to be taken. The time limitation also forced a different approach to measuring a person's career choice. Instead of actually determining whether or not a person has separated, the surrogate measure of career intent has been used. Actual separation, which would fall into Vroom's (1964) career attainment category, can be affected by external factors causing a person to behave in a manner inconsistent with his or her preferred choice. Thus, the accuracy of the results, whether favorable or unfavorable, can be applied to turnover only so far as the career intent measure is correlated with actual turnover, as discussed in Chapter II.

The Questionnaire

In constructing the questionnaire, previously validated measures were used wherever possible. However, the particular organizational environment (i.e., United States Air Force) of this study, and the fact that there were no specific Expectancy Theory studies of turnover in the form of separation prior to retirement preceeding this one, required that a large portion of the questionnaire be prepared especially for this study. The principal guide in constructing the questionnaire was adherence to the concepts and definitions set forth by Vroom (1964).

Identification of Relevant Second-Level Outcomes. The first task in designing the questionnaire was to select the second-level outcomes required in the valence and general models of Expectancy Theory. Since the principal characteristics of the sample population were known, it was possible to proceed with the selection of second-level outcomes.

The literature indicates that this selection process should be based on some method that will yield outcomes known to have relevance to the subjects of the study. Various methods include letting the subjects generate their own list (Mitchell and Biglan, 1971) or using an open-ended list which would combine a preselected list with the ability for the subject to add his own relevant outcomes (Reinharth and Wahba, 1975). Parker (1974) used interviews with a subgroup of the sample to provide a suitable list.

In the end, none of these methods were adopted. Leaving the outcomes strictly up to the respondent was viewed as making the analysis almost impossible due to lack of comparability between respondents. The open-ended list and interview were not used due to time required to compile and finalize a uniform list. The use of a uniform list was considered necessary to facilitate within-person and across-person tests of the model, although it was understood that this could result in lowering the predictive ability of the model for reasons discussed in Chapter II.

After eliminating personal contact and preliminary questionnaires as sources of relevant outcomes and rewards, the next best source appeared to be a review of studies, both military and civilian, involving career intent, turnover, and job satisfaction. Job satisfaction is included because this study deals with it and because it is known to be related to turnover. In addition, job satisfaction is usually presented as composed of several more basic components which are of interest here.

The resulting sources for outcomes were (1) 6 civilian studies and literature reviews; (2) 11 military studies from the Army, Navy, and Air Force; and (3) the knowledge and experience of this writer and the research advisor. These personal inputs resulted in subdividing some

of the broader categories found in the literature. In all, 20 outcomes were selected from the above sources (see Table IV) and each is identified in at least two of them.

Prior to final inclusion in the questionnaire, these outcomes were pretested by administering a prototype of the survey instrument to members of the 1978 classes in Systems Management and Operations Research. Out of the 50 questionnaires distributed, approximately 80 percent were returned and analyzed.

The usefulness of a particular outcome was determined by examining the means, standard deviations, and overall distributions of the valence and instrumentality measures using the Statistical Package for the Social Sciences (SPSS) computer program. On the basis of this analysis, each of the 20 outcomes appeared to have some relevance and potential contribution to the Expectancy Theory model. Consequently, all 20 career outcomes were retained in the final form of the questionnaire. These outcomes are referenced throughout the remainder of this report, and it is convenient to utilize a shorthand of symbols to designate each of the outcomes. The list and definition of each are presented in Table V. In the survey instrument (see Appendix A) the 20 outcomes appear three times, once in each of Parts II, III, and IV. Because of the amount of handling required in the data analysis and to aid proofreading and error checking, each outcome is always associated with the number that appears to its left in Table V. For example, in each of the questionnaire parts mentioned above, item 4 refers to job security (JOB.SECUR).

Physical Format. There are three types of data asked for on the questionnaire: (1) personal or demographic data, (2) component measures

Table IV

Sources of Survey Outcomes[a]

OUTCOMES \ SOURCES	Alley, et al. (1975)	DAPE-PMP (1973)	Farris (1971)	Feris, et al. (1976)	Hawk (1976)	Hughes, et al. (1973)	Maloney (1973)	Mitchell, et al. (1972)	Mobley, et al. (1977)	Parker (1974)	Patterson (1977)	Porter, et al. (1973)	Shenk, et al. (1971)	Stoloff, et al. (1972)	Vroom (1966)	Vrooman (1976)	Waters, et al. (1976)
1. $.FOR.ABIL		✓	✓		✓	✓	✓		✓			✓	✓				✓
2. $.FOR.PERF		✓	✓		✓	✓	✓		✓			✓	✓				✓
3. HIGH.$		✓								✓			✓		✓		
4. JOB.SECUR					✓	✓	✓						✓	✓			
5. PROMOT.ABIL							✓	✓	✓			✓	✓		✓		✓
6. PROMOT.PERF							✓	✓	✓			✓	✓		✓		✓
7. PERF.APPRAIS						✓										✓	
8. DISCIPLINE		✓				✓									✓	✓	✓
9. QUAL.LDRSHIP		✓		✓	✓	✓			✓		✓	✓	✓			✓	
10. PERS.GROWTH			✓					✓		✓	✓		✓			✓	
11. JOB.CHALLNG	✓					✓				✓	✓	✓				✓	
12. RETIREMENT											✓						
13. AUTONOMY			✓	✓				✓	✓	✓		✓			✓		
14. SELF.FULFILL			✓	✓				✓		✓			✓	✓			
15. MOBILITY		✓								✓			✓	✓			
16. RECOGNITION						✓		✓		✓			✓			✓	
17. PRESTIGE						✓		✓					✓		✓		
18. UTILIZATION	✓				✓		✓		✓		✓	✓					
19. FAMILY.SEP										✓			✓				✓
20. FAMILY.OPIN		✓								✓			✓	✓			

[a]Outcomes are described in Table V.

Table V

Second-Level Outcome Abbreviations and Definitions

Abbreviation	Definition
1. $.FOR.ABIL	Being paid a salary that is commensurate with your abilities.
2. $.FOR.PREF	Being paid a salary that is commensurate with your job performance.
3. HIGH.$	Earning the highest salary possible.
4. JOB.SECUR	Job security.
5. PROMOT.ABIL	Promotions based on your ability.
6. PROMOT.PERF	Promotions based on your job performance.
7. PERF.APPRAIS	A fair and unbiased performance appraisal system.
8. DISCIPLINE	Enforcement of discipline (i.e., a set of rules and regulations governing personal behavior in areas such as: dress and appearance, and associations with other members of the organization).
9. QUAL.LDRSHIP	Fair and effective leadership and supervision.
10. PERS.GROWTH	Personal growth (i.e., developing your capacities, education/training).
11. JOB.CHALLNG	An interesting and challenging job.
12. RETIREMENT	A 20-year retirement program with a monthly pension of 40% of your total salary. (This would be equivalent to approximately 50% of your base pay in the Air Force.)

Table V (Cont'd)

Abbreviation	Definition
13. AUTONOMY	Autonomy and self-direction in accomplishing your work.
14. SELF.FULFILL	A feeling of accomplishment and self-fulfillment as a result of your work.
15. MOBILITY	Permanent relocations every four years or less.
16. RECOGNITION	Recognition of your achievements and accomplishments by your organization.
17. PRESTIGE	Prestige in terms of respect, standing, and esteem in the eyes of others.
18. UTILIZATION	Effective use of your abilities and training by your organization.
19. FAMILY.SEP	Extended separation from your immediate family (if married) or from home and friends (if unmarried).
20. FAMILY.OPIN	A favorable attitude on the part of your spouse (if married) or immediate family (if unmarried).

required by the general model of Expectancy Theory, and (3) measures of the criteria specified for this research.

The questionnaire (see Appendix A) is constructed in six parts with the items in each numbered separately. Part I contains the demographic questions including an Officer Effectiveness Report (OER) performance measure. Parts II, III, and IV contain the measures of valences for the second-level outcomes and the associated instrumentalities for both Air Force and civilian careers. Part V is devoted exclusively to the assessment of expectancies for the two careers, and Part VI is composed of the four criterion measurements.

Part I - The Demographics. Eight questions are asked covering grade, total federal military service, educational level, marital status, sex, AFSC, OER ratings, and career status. The OER, career status (i.e., regular, career reserve, and reserve), and educational level questions are included to aid in later validation of the expectancy questions.

Part II - Valence. Respondents were asked to indicate their valence or desire for each of the 20 second-level outcomes. The instructions to this section specifically indicated valence to be a measure of desire. Only one set of valences is measured and is used with the instrumentalities for both Air Force and civilian careers. Though one study has used a separate set of valence measures for each career choice involved (Parker, 1974), the use of a single set is consistent with Vroom (1966) and the majority of empirical studies reviewed.

Valence is measured using a verbally anchored, bi-polar, 11-point scale that ranges from "EXTREMELY UNDESIRABLE" (-5) to "EXTREMELY DESIRABLE" (+5). The midpoint of the scale (0) is identified as "INDIFFERENT." The reason for choosing the 11-point scale over a 7-point or

9-point is related to the choice of outcomes. Several of the outcomes were anticipated as being primarily positive or negative. This would mean that the majority of the responses would fall into the positive or negative portion of the scale, thus cutting the effective range from 11 to 5 or 6. By reducing the scale to 7 or 9, the potential variance in a primarily positive or negative outcome would be so limited as to reduce the effectiveness of any correlation or regression analysis.

Parts III and IV - Air Force and Civilian Instrumentalities. These two sections are designed to measure the degree of perceived association between each of the 20 outcomes and an Air Force career (Part III) and between the outcomes and a civilian career (Part IV). The items in these two sections are measured using a verbally anchored 11-point scale as were the valences. Mitchell (1972) recommends this particular consistency to avoid giving greater weight to one component than the other. Each item makes a statement of association between an outcome and a particular career; the respondent is then asked to indicate agreement or disagreement. As a result, the scales are anchored by "COMPLETELY DISAGREE" (-5) and "COMPLETELY AGREE" (+5) with the midpoint (0) indicating "UNDECIDED."

Part V - Expectancy. This measure is designed to capture a person's perceived probability of attaining a particular career if he or she exhibits the behavior of attempting to attain it. In other words, what is the perceived probability of making an Air Force or civilian career if the person attempts it. Because of the wide variance in what constitutes a civilian career, both careers were defined specifically:

> Air Force Career - Reaching retirement eligibility by completing 20 years of active duty service and attaining the grade of at least lieutenant colonel within those 20 years.

Civilian Career - An equivalent civilian career is considered to be attaining a position at least equivalent in overall salary and responsibility to a lieutenant colonel in the Air Force within 20 years.

The expectancies are measured on an 11-point scale ranging from 0 percent to 100 percent in increments of 10 with principal verbal anchors of "NO CHANGE" (0 percent) and "CERTAINTY" (100 percent). The scaling is consistent with Vroom's specifications for these two model components.

Due to the nature and importance of the expectancy measures, a validation exercise was done for both the Air Force and civilian measures. It was hypothesized that the Air Force expectancy would be higher for subjects with higher overall OER ratings. It was also anticipated that expectancy would rise with career status: from reserve to career reserve to regular. To test these assumptions, an average OER score was computed from the OER ratings given by the respondent. The association between Air Force expectancy and these two demographics was measured with a bivariate correlation. The civilian expectancy was tested in a similar manner using the education demographic based on the hypothesis that the higher the level of education, the higher the perceived probability of success in making a civilian career.

Part VI - Criterion Variables. Unlike the component measures for the Expectancy Theory model, there were measures available for the criterion variables that had been subjected to prior validation. The theoretical and empirical bases for these measures of career intent, job satisfaction, institution orientation, and occupation orientation are outlined in Chapter II.

The first four questions in Part VI of the questionnaire comprise the Hoppock overall job satisfaction measure as described by McNichols, Stahl, and Manley (1978). Career intent is measured by question 5 using a 7-point scale. The components of the institution and occupation measures make up the final 8 questions (6 through 13). The questions applying to each are intermixed, and the specific measures are associated with the questions as follows:

Institution Orientation - Questions 6, 9, 10, and 11

Occupation Orientation - Questions 7, 8, 12, and 13

A validation of these measures was done by Stahl, Manley, and McNichols (1978).

The Sample

At the outset of this project, the concern with turnover and the career fields involved were conveyed by personal contact with the Military Personnel Center (MPC). These were later confirmed by letter from Colonel Lawrence McNeil of MPC along with a pledge of support for the research (see Appendix C). The need for a search of MPC's records to identify potential respondents was made known. Attention was then turned to the questionnaire which had to be constructed to obtaining the required Air Force approval to proceed with the survey.

By the time the questionnaire was finalized, the list of potential respondents was received from MPC. Some of the general characteristics of the sample population were established at the very outset of the project, such as: (1) engineering and scientified career fields and (2) less than four years total service. MPC provided a list of Air Force personnel drawn from their master file to meet these requirements.

Initially the list contained the names of 1,060 first and second lieutenants stationed around the world, and it was immediately obvious that time constraints would prevent trying to survey them all. The first reduction eliminated all personnel stationed outside the continental United States. The remaining reductions were based on the methodology for administering the survey.

The goal for administering the survey was to insure the highest possible return rate. Several strategies were considered and discarded until it was finally decided to establish a single point of contact for each organization who would have some interest in the project and also be in a position to establish a favorable atmosphere in the organization concerning completing and returning the questionnaire. The most likely candidates appeared to be the directors of personnel for each organization, though in some cases the contact was actually made through a commander or branch chief when the personnel shop was fairly far removed from contact with the organization.

This approach also imposed several limitations on the selection of respondents. In establishing the contacts, telephone calls and written correspondence were required (Appendix D contains sample contact point letters). Thus, the time required could not be justified for organizations with less than 10 potential respondents or in situations where the subjects were so widely scattered that one contact point could not account for more than 10 respondents (some contacts dealt with more than one organization).

The elimination process resulted in a final list of 806 questionnaire recipients located at 14 bases or stations and spread among 27 different organizations (see Table XXX, Appendix G). The majority of

the questionnaires were mailed directly to the recipient with a pre-addressed return envelope enclosed. Exceptions were organizations where exact mailing addresses could not be determined in advance and the organization kindly agreed to accept the questionnaires in a bundle and distribute them locally. The questionnaires handled in this manner were still returned via the enclosed envelope.

In addition to making organizational contact, each questionnaire carried a cover letter from the research advisor and the principal researcher (see Appendix B) soliciting support for the research in the form of completing and returning the questionnaire. As a small added inducement, each person sending a request would be sent a summary of the research findings. The final result of these efforts was a total return of 621 questionnaires or 77 percent by the cutoff date. Four of these were later rejected because of AFSCs that were not suitable for this study.

Data Analysis and Procedures

Analysis of the data collected in this study was carried out using the program packages of the Statistical Package for the Social Sciences (SPSS) and the AFLC Honeywell 635 computer system (CREATE). The analysis can be divided into three principal components.

1. Descriptive statistics and validation: The first procedure was generation of frequency distributions and histograms to permit assessment of the response distributions. A quality check was done by comparison of certain results with known data to insure accuracy in the data formats and computations of the Expectancy Theory model components.

2. Within-person test: In accordance with the recommendations of Mitchell (1974) and Nebeker and Moy (1976), the principal testing of the model was conducted as within-person. The methodology was as consistent as possible with the recommendations of Vroom (1964) and the actual implementation by Vroom (1966). The various first-level valences and force scores were calculated for both the Air Force and civilian career possibilities. The career choice indicated by the difference of the two forces was compared through statistical procedures to the career intent criterion. Throughout the remainder of this report, these first-level valences and force scores plus any constructs computed directly from them are referred to as first-level or major predictors. The second-level valences, instrumentalities, and associated constructs will be designated as second-level or minor predictors.

3. Across-person analysis: The within-person testing of the model assumes, by virtue of the simple summation (Σ IV), that all 20 of the instrumentality-valence (IV) products are equally weighted. Mitchell (1974) has questioned this particular assumption. Indeed, it would appear that the decision set for most people is somewhat less than 20 (Miller, 1956) and that certain of the second-level predictors weigh more heavily than others.

One way to examine this hypothesis is to use multiple regression techniques to determine those variables that explain the greatest amount of variance in the career intent measure. It is recognized that multiple regression, as an across-person technique, identifies a predictor set that represents an average for the entire sample and that individual predictor sets may vary considerably. Nevertheless, these across-person

results are important from an organizational standpoint to identify specific areas of concern where improvement efforts are likely to produce the greatest results.

SPSS Analysis Design. The SPSS program package on the CREATE system conforms to the specifications and guidelines set forth in Nie et al. (1975). All SPSS program runs made in the course of this research conform to the requirements presented in this reference. Prior to beginning the analysis outlined above, several manipulations of the raw questionnaire data were required.

The survey questionnaires were returned with the responses circled, X'd, or otherwise marked on the questionnaire. The responses were transferred to and accumulated on coding forms until the cutoff date. Following cutoff, the responses were keypunched and the resulting data deck loaded into permanent storage on CREATE. This preliminary data file contained only the demographic, valence, instrumentality, expectancy, and criterion variable responses. Several procedures were required to generate all the data required in the analysis.

The first step was to have SPSS recode all alphanumeric responses to numeric. In the course of the recoding, the response order of questions 1, 4, 5, 7, and 8 of Part VI was reversed to permit correct computation of the criterion variables. Secondly, the OER average, Hoppock job satisfaction measure, and the institution-occupation measures were calculated. Finally, the additional components required by the general model were computed.

As part of the coding process, variable names were generated for all elements on the questionnaire and for the various constructs. During the course of the research these names have been useful as a

form of shorthand in referring to the many different variables involved in the analysis and are used in the same way in this report. Table VI presents these variables and their descriptions.

The recoding of the alphanumeric responses and computation of the various constructs were very expensive in terms of computer core memory such that the first SPSS procedure used was WRITE CASES, which created another data file that contained all the computed and recoded variables, thus eliminating these transformations from each subsequent run.

Descriptive Statistics. Using the newly created file, the FREQUENCIES procedure was used to generate frequency tables, descriptive statistics, and histograms for all the original and computed variables except VALlLAF, VALlLCV, TOTALV, FORCEAF, FORCEACV, and TOTALF. The potential range and nature of these variables was such that the tables and histograms thus produced would have been so large that they would have been impractical to print and interpret. As a result, the CONDESCRIPTIVE procedure was used to produce only the descriptive statistics for these variables.

Expectancy Validation. The next step was validation of the expectancy measures and the basic combinatorial properties of the model. Rigorous validation of the expectancy measures was not possible with the type of information collected on the questionnaire; however, as indicated earlier, certain correlations served to indicate the effectiveness of the measures.

The expectancy validity was tested using the PEARSON CORR procedure which computes Pearson product-moment correlations. The OER average is essentially a continuous variable, and the responses for STATUS are arranged to form an ordinal scale. The results of this analysis are not expected to be as conclusive, but they provide insight into the

Table VI

SPSS Variable Names and Descriptions

Variable Name	Description	Quest. No.
GRADE	Current active duty grade.	I-1
TAFMS	Total active federal military service time.	I-2
ED	Education level.	I-3
MARITAL	Marital status.	I-4
SEX	Sex of respondent.	I-5
AFSC	Duty AFSC.	I-6
OER1	Reviewer's rating on most recent OER.	I-7a
OER2	Reviewer's rating on second most recent OER.	I-7b
OER3	Reviewer's rating on third most recent OER.	I-7c
OER	OER average computed from the sum of OER1+ OER2+OER3 divided by the number of nonzero ratings; missing ratings were entered as zero.	--
STATUS	Career status.	I-8
VAL2L1 to VAL2L20	Valences of the 20 second-level outcomes; right-most digits (1 to 20) of the variable name correspond to the number of the outcome as shown in Table V.	II-1 to II-20
AFINS1 to AFINS20	Air Force instrumentalities. Right-most digits (1 to 20) of the variable name correspond to the number of the associated outcome as shown in Table V.	III-1 to III-20
CVINS1 to CVINS20	Civilian career instrumentalities. Right-most digits identify the associated outcome as shown in Table V.	IV-1 to IV-20
AFIV1 to AFIV20	Air Force instrumentality-valence products computed from (VAL2L1) x (AFINS1) to (VAL2L20) x (AFINS20).	--
CVIV1 to CVIV20	Civilian career instrumentality-valence products computed from (VAL2L1) x (CVINS1) to (VAL2L20) x (CVINS20).	--
VAL1LAF	First-level valence for Air Force computed as AFIV1+AFIV2+...+AFIV20.	--

Table VI (Cont'd)

Variable Name	Description	Quest. No.
VAL1LCV	First-level valence for civilian career computed as CVIV1+CVIV2+...+CVIV20.	--
TOTALV	Difference of the two first-level valences computed as VAL1LAF-VAL1LCV.	--
AFEXPCT	Expectancy of being able to make a career of the Air Force.	V-1
CVEXPCT	Expectancy of being able to make a civilian career.	V-2
FORCEAF	Force toward Air Force computed as (AFEXPCT) x (VAL1LAF).	--
FORCECV	Force toward a civilian career computed as (CVEXPCT) x (VAL1LCV).	--
TOTALF	Difference of the two forces computed as FORCEAF-FORCECV.	--
JOBSAT1 to JOBSAT4	The four components of the Hoppock job satisfaction measure. JOBSAT1 and JOBSAT4 responses are reversed before computation.	VI-1 to VI-4
HOPPOCK	Hoppock job satisfaction score computed as JOBSAT1[a]+JOBSAT2+JOBSAT3+JOBSAT4[a].	--
CAREER	Career intent.	VI-5
INSTN1 to INSTN4	Components of institution-orientation measure.	VI-6, VI-9, VI-10, VI-11
INSTN	Institution-orientation measure computed as INSTN1+INSTN2+INSTN3+INSTN4.	--
OCCPN1 to OCCPN4	Components of occupation-orientation measure. OCCPN1 and OCCPN2 responses are reversed prior to computation.	VI-7, VI-8, VI-12, VI-13
OCCPN	Occupation-orientation measure computed as OCCPN1[a]+OCCPN2[a]+OCCPN3+OCCPN4.	--

[a]Responses to this question must be reversed prior to inclusion in the computations.

appropriateness of the expectancy measure as implemented in this study. In a similar fashion, CVEXPCT was correlated with ED.

Model Validation - Within-Person. Attempting to validate the specific combinatorial properties of the valence and choice models presents a more difficult problem both conceptually and methodologically. The debate presented in Chapter II concerning within-person and across-person analyses must be accommodated in considering a methodology for this test. Because nothing conclusive has been presented in connection with this problem, the validation is approached from both standpoints.

The method used in this study to predict career intent is to first calculate both force scores: FORCEAF and FORCECV. Vroom's (1966) own methodology is to predict the choice of organization by identifying the one associated with the highest force score. The fact that the career career intent measure is at least ordinal in nature and not dichotomous makes this approach impractical. Instead, a new variable, TOTALF, is computed by FORCEAF-FORCECV. A higher force for the Air Force is then indicated by a positive value for TOTALF. A higher civilian force will make TOTALF negative. Using TOTALF, a prediction of career intent may be made in a way relatively consistent with Vroom (1966) and Parker (1974) by computing the correlation between CAREER and TOTALF. This correlation is the basis for the within-person validation as well as the rest of the within-person analyses in this study.

The within-person validation of the model is composed of four steps:

1. The first step is to compute the first-level valences using only the second-level valences (Σ V). The predictive correlation is

then computed using CAREER and TOTALF. The component forces, FORCEAF and FORCECV, are calculated from the first-level valences as indicated by the choice model formulation from Chapter II.

2. The second procedure consists of replacing the second-level valences in the civilian and Air Force computations with the civilian and Air Force instrumentalities, respectively. The predictive correlation is now calculated based on instrumentalities (Σ I).

3. The third correlation of CAREER and TOTALF is based on an additive form of the model where the second-level valences and instrumentalities are summed instead of multiplied (Σ I+V).

4. Finally, the model is constructed as shown for the general model with the instrumentalities and second-level valences multiplied together in pairs and summed to form the first-level valences (Σ IV). Again, the predictive correlation is computed. This step yields the complete general Expectancy Theory model.

Upon completing the computation of all four correlations, they can be compared. If the components of the model perform as predicted, the magnitude of the correlation should increase from the model using valence only to the model with instrumentality only to the valence times instrumentality formulation. Additionally, the multiplicative model should perform significantly better than the additive model. The correlation coefficients may be compared for significant differences using Fisher's r to z transformation (Snedecor and Cochran, 1967, Ch 7). This test of significance has also been used by Mitchell and Albright (1972). With respect to the appropriateness of the test they said,

> The test demand that independent samples be used was not applicable in this case. However, this lack of independence should work against the investigator in the sense that lack of independence should increase rather than decrease the similarity in magnitude of the coefficients (p.12).

Model Validation - Aross-Person. The across-person analysis also uses separate tests involving the same predictor variables. However, the valences and instrumentalities are used as predictors in a multiple regression model. The interactions of all the components are tested by the following series of regressions:

1. Regression of CAREER with VAL2L1 to VAL2L20 (all second-level valences);

2. Regression of CAREER with AFINS1 to AFINS20 (all Air Force instrumentalities);

3. Regression of CAREER with VAL2L1 to VAL2L20 and AFINS1 to AFINS20 (all second-level valences and instrumentalities);

4. Regression of CAREER with AFIV1 to AFIV20 (all Air Force IV products);

5. Regression of CAREER with AFIV1 to AFIV20 and AFEXPCT (all Air Force IV products plus expectancy as an additive term);

6. Regression of CAREER with AFIVE1 to AFIVE20; the AFIVE terms were constructed especially for this test and consist of the individual Air Force IV product terms, each multiplied by the Air Force expectancy.

The regression coefficient values (R) are again compared with the expectation of a visible trend toward higher values as additional Expectancy Theory components are included in the regression. This approach is patterned after that of Stahl (1978) and is similar to Gavin (1970). One important aspect of these regressions is that they

are not stepwise. The entire set of predictor variables for each regression are forced into the equation. The significance of each variable or lack of significance will not alter the predictor set from regression to regression.

Predictive Testing - Within-Person. The predictive ability of the Expectancy Theory model is tested in a manner similar to the validation procedures. For the within-person test, a Pearson product-moment correlation is calculated for each of the major or first-level predictors (i.e., TOTALF, FORCEAF, FORCECV, TOTALV, VALlLAF, and VALlLCV) with the criterion variables (i.e., CAREER, HOPPOCK, OCCPN, and INSTN). The correlations will be calculated based on the entire sample and also for each individual year group by TAFMS response for career intent (CAREER). Alley and Gould's (1976) findings of increased accuracy of the career intent measure with time in service makes this additional testing desirable. It is anticipated that the correlations of the major predictors with CAREER increase with time in service. The within-person test provides the information to test the hypotheses presented in Chapter II.

The testing of the model will be more exhaustive for the career intent criterion in accordance with the objectives of the study; thus, specific tests by year group or other division will not be conducted for the other criterion variables (i.e., HOPPOCK, OCCPN, and INSTN). Additionally, the rationale for the time in service division does not hold for the other variables.

Again, it is recognized that a correlation approach to testing the model is not an ideal approach. It would be conceptually more palatable to split the major predictors and the CAREER criterion into dichotomous

variables that would permit some form of nonparametric test, such as a two-by-two contingency table similar to Parker (1974). Unfortunately, this reopens Schmidt's (1973) arguments concerning the psychometric properites of the scales involved.

The CAREER criterion has an implied zero point (UNDECIDED) and the TOTALF predictor has an actual zero point when FORCEAF and FORCECV are equal. In spite of this, the assumption that these are ratio scales, which is a necessary condition for them to be split at the zero point into dichotomous variables, is highly suspect. Also, the statistical treatments needed to determine the true zero points of the scales are not possible with the data available. The end result is carrying the within-person approach as far as absolutely possible, then resorting to a correlation to link the major predictors (TOTALF) with the principal criterion (CAREER). This is not totally without conceptual support since the correlation procedure will show the degree of correspondence between the TOTALF score and CAREER for each respondent.

Predictive Testing - Across-Person. One of the principal goals of this research project is to provide information concerning specific career outcomes that are important in the career decision. The Expectancy Theory model used in this study assumes equal weighting of all 20 career outcomes. This would mean an equal contribution to career choice by all outcomes in the form of instrumentality-valence (IV) product terms.

Mitchell (1974) and Mitchell and Pollard (1973) have questioned the equality of weighting and, indeed, it appears intuitively unlikely that of any given set of predictors all would contribute equally to the decision process. This seems especially true since Vroom (1964)

specified no particular method of selecting outcomes, and there has been no consensus on selection to evolve out of later studies.

Thus, it appears necessary to depart from the within-person methodology and examine the available information from an across-person standpoint to identify the important outcomes across the entire sample. Across-person analysis using multiple regression was chosen to accomplish this task but, in light of the questions raised about its applicability, some additional discussion is warranted.

This writer has found that in using regression much of the Expectancy Theory model is essentially discarded. The IV products are computed, the used directly as predictors in the regression model. This captures the interaction of instrumentality with valence but eliminates any further consideration of the structure imposed by the Expectancy Theory model. The elements of first-level valence, expectancy, and overall force are bypassed by the regression which relies on variance and covariance to determine the relationship between the IV products and CAREER.

Once the regression is complete, the results need be interpreted only with respect to the concepts of valence, instrumentality, and their basic multiplicative interaction plus the statistical implications of the multiple regression process. The end result is a methodology that does not actually test the abilities of Expectancy Theory as a whole, but rather examines the usefulness of the basic components of valence and instrumentality and their interaction.

The across-person analysis was conducted for the four criterion variables (CAREER, HOPPOCK, INSTN, and OCCPN) using the total sample. In addition, separate across-person analyses were conducted for CAREER using responses grouped by TAFMS category (i.e., year group). The

multiple regression model was generated using the REGRESSION procedure of SPSS with the type of regression specified as stepwise (forward inclusion). This approach differs from the validation regression in that the regression process terminates when the next variable to enter the equation has an F value less than 3.84 to 4.0, depending on the size of the group. These F values represent a significance level of .05.

The predictor or independent variable set for all the regressions save one consists of the 20 IV products for the Air Force (AFIV) and the 20 IV products for a civilian career (CVIV). The inclusion level is the same for all the predictors such that neither the Air Force nor civilian set is favored. The one predictor set that is different is for HOPPOCK, which uses only the AFIV terms since job satisfaction pertains only to the Air Force. The results of the validations, within-person tests, and across-person analyses are presented in Chapter IV.

IV. Results

Overall, the tests of the Expectancy Theory models showed positive results. The more important tests of predictive ability were consistent and positive while the tests of combinatorial properties produced rather mixed results. These resulted are presented in the same order as discussed in Chapter III, beginning with the descriptive statistics.

Descriptive Statistics

The descriptive statistics (shown in Appendix E, Tables XV through XXII) were unremarkable with one minor exception. When the sample population was drawn by MPC, they identified personnel with less than four years commissioned service time rather than four years total active duty service time, which produced many respondents with more than four years of total service. Also, survey time lag added to this group. The list was drawn effective April 30, 1978. The questionnaire did not begin reaching recipients until the middle of June 1978. In the intervening time, over six percent of the sample was promoted to captain, which usually indicates four years or more of total service. Thus, almost one-third of the total sample had more than four years of service.

The original intention of using only data from personnel with four years or less was based on the desire to work with the population containing the greatest amount of variance in career intent. At one time the overall trend was for career intent to stabilize after five or six years. Recent conversations with MPC have indicated that there is a significant number of voluntary separations as late as the ten-year

group. As a result, all time-in-service categories were included in the overall analysis with subanalyses done for each year group.

Before beginning the analyses, it is worthwhile to look at the correlation between CAREER and HOPPOCK. Mobley (1977) reported correlations as high as .37 between turnover and job satisfaction. Table XXIII (Appendix F) contains the correlations among the criterion variables and among the major predictors. The bivariate correlation for CAREER with HOPPOCK is .40 ($p < .001$). Considering that the career intent measure is a self-reported analogue of turnover, the correlation in this study appears to be consistent with that found by Mobley (1977).

Expectancy Validation

The results of the correlation analysis to validate the expectancy measures are presented in Table VII. The specific correlations that were used to validate each expectancy are underscored in the table. For both cases, AFEXPCT and CVEXPCT, the relevant correlations were statistically significant and in the predicted directions. Unfortunately, the largest amount of variance explained in any of the three correlations was less than three percent. The implication of this is that the measure is not psychometrically valid and may contribute little, if anything, to the predictive ability of the model.

Model Validation

The tests of the combinatorial properties of the Expectancy Theory model did not provide any clear-cut support for combining the components as suggested by Vroom (1964). The first test was principally within-person using bivariate correlations to test the association between the major predictors, FORCEAF and VALlLAF, with the two criterion, CAREER and

Table VII

Summary of Correlations of Expectancies with Validation Demographics[a]

	ED	OER	STATUS
AFEXPCT	.05 (.116) n=611	-.16 (.001) n=431	-.13 (.001) n=607
CVEXPCT	.12 (.001) n=612	-.11 (.011) n=432	-.03 (.195) n=608

[a]Format: Correlation Coefficient
(Significance, one-tailed test)
n=Sample size after pairwise deletion of missing cases.
Entries related to validation are underscored.
Variable name abbreviations are described in Table VI.

HOPPOCK. The second test consisted of multiple regressions with the same two criterion. In both cases, the predictor variable set consisted of varying combinations of the principal components of the Expectancy Theory model.

Within-Person Validation. The results of this analysis are summarized in Table VIII. The use of a within-person approach to validation should overcome some of the measurement and scale problems mentioned by Mitchell (1974). Examining the results in Table VIII, certain trends are noticeable. With one exception, the correlations with VALlLAF are all higher than the correlations with FORCEAF. The Fisher r to z transformation (described in Chapter III) did not show any of the differences to be significant at the .05 level. Still, the differences are consistent and support the previous finding that the expectancy measure (i.e., the quantity whose inclusion distinguished FORCEAF from VALlLAF) used in this study adds nothing to the power of the model.

Table VIII

Summary of Correlations for
Within-Person Validation[a]

	FORCEAF	VAL1LAF
CAREER	.15 (.001) n=600	.23 (.001) n=602
(Σ V)[b]		
HOPPOCK	.20 (.001) n=555	.15 (.001) n=557
CAREER	.41 (.001) n=552	.43 (.001) n-554
(Σ I)		
HOPPOCK	.40 (.001) n=552	.44 (.001) n=554
CAREER	.34 (.001) n=588	.44 (.001) n=590
(Σ I+V)		
HOPPOCK	.37 (.001) n=548	.42 (.001) n=550
CAREER	.47 (.001) n=588	.48 (.001) n-590
(Σ IV)		
HOPPOCK	.37 (.001) n=548	.42 (.001) n=550

[a]Format: Correlation Coefficient
(Significance, one-tailed test)
n=Sample size after pairwise delection of missing cases.
Entries related to validation are underscored.
Variable name abbreviations are described in Table VI.

[b]Components used to generate VAL1LAF.

As far as the relationship between formulations is concerned (looking at VALILAF), the predictive ability of the model using only instrumentalities is significantly ($p < .05$) greater than with the use of valences only. Beyond this, the additive model (Σ I+V) for CAREER and HOPPOCK produces inconsistent and nonsignificant differences with the Σ I model. The Σ IV formulation does no worse than the Σ I+V, but shows no significant improvement over the Σ I model either.

Across-Person Validation. Table IX presents the results of the multiple regression tests of the model components. Tests using the Hoppock criterion do not include an expectancy component since the valence model has been used in part research as best-suited for measurement of job satisfaction. The use of expectancy is limited to the choice model and applies to the CAREER criterion. In these regressions the predictor variables were all forced into the regression as a set.

The results are consistent with the within-person tests from the standpoint that instrumentalities produce a significantly higher multiple correlation coefficient (R) and greater explanation of variance (R^2) than valences. The regressions using combinations of instrumentality and valence (i.e., I+V and IV), once again, did not produce correlations that were significantly different from each other or from I alone. These results are consistent with the within-person analysis in that neither within- nor across-person tests have shown any combination of I and V to be a significantly better predictor than I alone.

The results of the validation tests leave some question as to how to proceed in testing the predictive ability of the model. Since there appears to be little difference between the Σ I model and the Σ IV model,

Table IX

Summary of Regressions for
Across-Person Validation[a]

Model	Criterion	Multiple R	Degrees of Freedom[b]		F	Sample Size
			Reg	Res		
V	CAREER	.51	20	581	10.06	602
	HOPPOCK	.32	20	536	3.11	557
I	CAREER	.60	20	573	16.03	594
	HOPPOCK	.63	20	533	17.70	554
I+V	CAREER	.66	40	549	10.75	590
	HOPPOCK	.65	40	509	9.47	550
IV	CAREER	.59	20	569	15.27	590
	HOPPOCK[c]	.63	20	529	17.20	550
IV+E	CAREER	.59	21	566	14.71	588
IVE	CAREER	.56	20	567	12.98	588

[a] All predictors are forced into the equation simultaneously. The number of predictors in the equation is given by regression degrees of freedom, and the type of predictors is shown in the model column.

[b] Reg = Regression degrees of freedom.
Res = Residual degrees of freedom.

[c] Expectancy model for HOPPOCK is shown in the model column. Variable name abbreviations are described in Table VI.

parsimony would indicate the use of the Σ I model. However, Vroom (1964) presents a very compelling conceptual argument for the use of both components.

Instrumentality is the perceived association between first-level and second-level outcomes. Even though this component appears to account for most of the predictive ability in the occupational preference and choice models, it is difficult to conceptualize a person's decision process without including some measure of liking or disliking for the outcomes related to a particular job. If a person is indifferent to an outcome, it seems unlikely that it would be strongly relevant to the person's decision even if one of the alternatives will provide considerably more of the outcome than another. Consequently, the remaining tests in this study will be conducted using IV products as proposed by Vroom (1964). This decision is consistent with Mitchell and Knudson (1953) who encountered the same weakness in valence but retained it in the model for conceptual reasons.

Another across-person result consistent with the within-person test is the behavior of expectancy. When the expectancy term was added the strength of the correlation dropped, similar to the difference between the within-person correlations for FORCEAF and VALlLAF. The close correspondence of the behavior of the expectancy measure in the within-person validation and the across-person validation, along with the low correlations in the expectancy validation, point out a definite flaw in the expectancy measure. Without speculating as to the exact nature of the problem, it is sufficient to assume that the expectancy, though potentially correct in theory, is psychometrically invalid as operationalized in this study.

This forces a slight shift in emphasis. The original intent was to develop the Expectancy Theory model primarily as occupational choice which would include an expectancy component. Without a usable measure of expectancy, this study is forced to rely on the valence model which is a measure of occupational preference. Use of a preference model is not entirely without precedent since Vroom (1966) based his empirical study on occupational preference.

In terms of predictor variables the first-level valences, VAL1LAF and VAL1LCV, replace the force scores, FORCEAF and FORCECV. The combined term used in the within-person predictive tests is TOTALV (VAL1LAF-VAL1LCV) instead of TOTALF (FORCEAF-FORCECV). The methodological developments in Chapter III for the predictive tests are still valid if the valence terms actually used are substituted for the force terms that were originally intended to be used.

Within-Person Predictive Test

The results of the within-person predictive tests are presented in Table X and Table XI. The hypotheses developed at the end of Chapter II are tested using these results. The first two hypotheses are tested using TOTALV.

Hypothesis 1a. Table X, in the TOTALV column, shows a consistently positive and significant relationship between career intent and the difference of the two first-level valences. In these correlations, TOTALV is positive if VAL1LAF is larger than VAL1LCV and negative if TAL1LCV is largest. CAREER is measured on a scale from one to seven, all positive. The correlations in the table indicate that TOTALV varies directly with CAREER to the extent indicated by the magnitude of the correlation coefficient.

Table X

Summary of Correlations for Within-Person Predictive Test on CAREER[a] (One-Tailed Test)

	TOTALV	VAL1LAF	VAL1LCV
CAREER (Total sample)	.52 (.001) n=577	.48 (.001) n=590	-.25 (.001) n=588
CAREER (TAFMS=1)[b]	-.51 (.001) n=115	.49 (.001) n=118	-.15 (.049) n=120
CAREER (TAFMS=2)	.58 (.001 n=138	.58 (.001) n=140	-.21 (.007) n=141
CAREER (TAFMS=3)	.46 (.001) n=61	.37 (.002) n=63	-.35 (.003) n=62
CAREER (TAFMS=4)	.73 (.001) n=85	.68 (.001) n=86	-.35 (.001) n=86
CAREER (TAFMS=5)	.44 (.001) n=177	.42 (.001) n=182	-.24 (.001) n=178

[a]Format: Correlation Coefficient
(Significance, one-tailed test)
n=Sample size after pairwise deletion of missing cases.
Entries of primary interest are underscored.
Variable name abbreviations are described in Table VI.

[b]TAFMS categories: "1" = <1 year; "2" = 1 year to 2 years; "3" = 2 years to 3 years; "4" = 3 years to 4 years; and "5" = > 4 years.

It should be noted that Alley and Gould's (1975) findings concerning measures of career intent are partially supported. With the exception of the two- to three-year group, the correlation coefficients increase with each succeeding group and peak with the three- to four-year group. Some implications of this observed pattern are discussed in Chapter V. As it is, in the fourth-year group the valence model explains 53 percent of the vairance in career intent (r=.73) compared to 27 percent (r=.52) for the total sample.

Hypothesis 1b. The only difference between this hypothesis and 1a is the use of FORCEAF and FORCECV instead of first-level valences. However, the lack of a suitable expectancy measure prohibits within-person testing of career choice.

Hypothesis 1c. This hypothesis actually deals with whether or not TOTALF is a better predictor of career intent than TOTALV. Vroom's concept of Expectancy Theory would indicate that it should be. Unfortunately, as presented previously, the invalid expectancy measure prevents this hypothesis from being tested.

Hypothesis 2a. The correlation coefficient for HOPPOCK with VALlLAF is .42 (see Table XI) and is statistically significant ($p < .001$). Consequently, this hypothesis is supported. In addition, an examination of the HOPPOCK row in Table XI shows VALlLAF to have the highest correlation with HOPPOCK, a finding that is consistent with the specifications of the valence model as the best predictor of job satisfaction.

Hypothesis 2b. This hypothesis specifically tests the use of the valence model for job satisfaction over the choice model similar to the previous discussion of 1c. However, the lack of a valid expectancy

Table XI

Summary of Correlations for Within-Person Predictive Test on All Criterion Variables[a] (One-Tailed Test)

	TOTALV	VALILAF	VALILCV
CAREER	.52 (.001) n=577	.48 (.001) n=590	-.25 (.001) n=588
HOPPOCK	.33 (.001) n=539	.42 (.001) n=550	.00 (.488) n=546
INSTN	.17 (.001) n=562	.17 (.001) n=575	-.06 (.070) n=573
OCCPN	-.57 (.001) n=576	-.51 (.001) n=589	.27 (.001) n=585

[a]Format: Correlation Coefficient
(Significance, one-tailed test)
n=Sample size after pairwise deletion of missing cases.
These correlations were done for the total sample.
Entries of primary interest are underscored.
Variable name abbreviations are described in Table VI.

measure precludes any testing or conclusions about the use of a choice or general model of job satisfaction versus a valence model.

Hypothesis 3. This hypothesis was constructed to test the association between VALILAF, VALILCV, and INSTN. Table XI shows the correlation between INSTN and VALILAF to be .17 ($p < .001$), and the correlation between INSTN and VALILCV as -.06 ($p < .07$). These correlations are in the expected direction though the civilian association is not significant. Some additional consideration will be given to this in Chapter V.

Hypothesis 4. This hypothesis tests OCCPN in a fashion similar to INSTN. Using VALILAF and VALILCV, the correlations are -.51 ($p < .001$)

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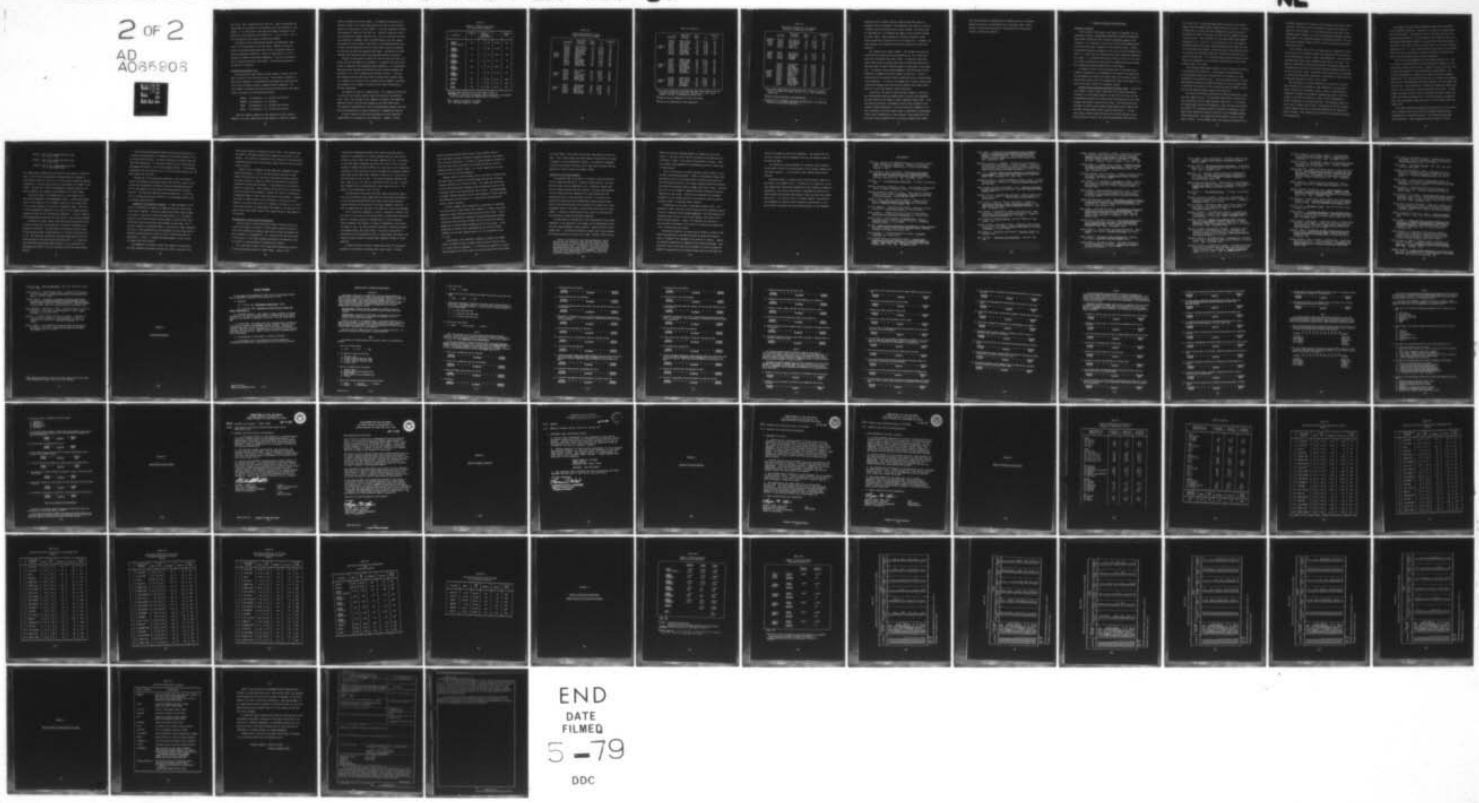

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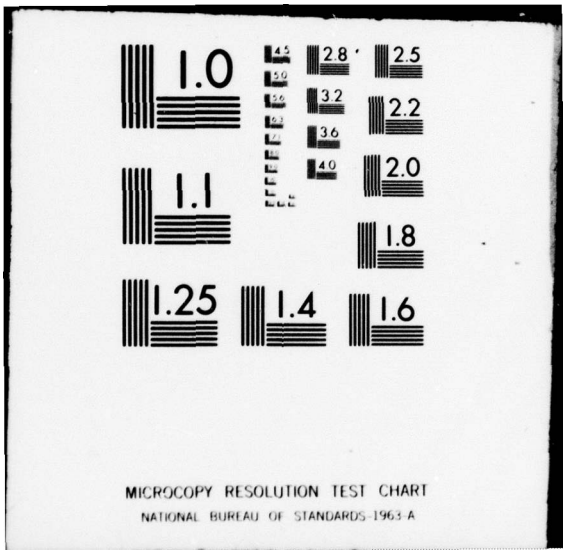
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and .27 ($p < .001$), respectively (see Table XI). These relationships are significant and correspond to the hypothesis; thus the hypothesis is supported. It is interesting to note that the highest correlation in the OCCPN row is the correlation with TOTALV (i.e., -.56, $p < .001$). This is also the predictor most highly correlated with CAREER.

The results of the within-person analysis are encouraging, especially for the three-year to four-year group. However, this type of analysis principally demonstrates the ability of Expectancy Theory to predict occupational preference. Within an organization it is still necessary to identify those model components, if any, that contributed more to the decision process than others. The across-person analysis provides this information.

Across-Person Predictive Test

The across-person tests employ the same format in terms of the variables involved as the within-person tests. The principal difference is that the IV components of the Expectancy Theory model are associated with the criterion variables through a stepwise multiple regression. The total number of predictors for each criterion variable input to the regressions is the same as in the within-person tests:

CAREER - 40 predictors, i.e., 20 AFIVs and 20 CVIVs;
HOPPOCK - 20 predictors, i.e., 20 AFIVs;
INSTN - 40 predictors, i.e., 20 AFIVs and 20 CVIVs;
OCCPN - 40 predictors, i.e., 20 AFIVs and 20 CVIVs.

Table XII contains summaries of the regressions on the criterion CAREER for the total sample and for each category of TAFMS plus HOPPOCK,

INSTN, and OCCPN for the total sample. For CAREER the regression R for the total sample is .65, which then increases for each of the individual groups to a high value of .84 for TAFMS=4. The actual predictors involved are presented in Table XIII and Table XIV. Table XIII shows the significant predictors for CAREER, again by time in service; and Table XIV shows the predictors for HOPPOCK, INSTN, and OCCPN based on the total sample. Associated with each variable in the table is the standardized beta coefficient from the regression and the F value, both of which are computed for the point at which the regression was halted. The Multiple R column indicates the cumulative R after the associated variable has entered.

Analysis of the results in Tables XIII and XIV (the significant variables) involves the behavior of variables in a regression and some consideration of meaning of the Expectancy Theory components. The standardized beta coefficient indicates the direction of the correlation between the predictors (i.e., the IV product terms) and the criterion. A positive beta indicates that as the value of the IV product term increases there is a tendency for the value of the criterion, such as CAREER, to increase. The strength of this tendency is related to the relative magnitude of the beta coefficient.

The opposite is true for a negative beta. For a negative coefficient, the value of the criterion tends to drop as the value of the predictor rises. Again, the strength of this tendency is related to the magnitude (absolute value) of the beta with respect to the other coefficients. This degree of interpretation is fairly straightforward; however, the meaning of the associations in terms of motivation is somewhat more obscure.

In other situations little else might need to be said concerning interpretation of the behavior of the predictors. However, in these

Table XII

Summary of Stepwise Regressions
for Across-Person Analysis

Criterion	Multiple R	Degrees of Freedom		F	Sample Size
		Reg	Res		
CAREER (Total Sample)	.65	11	565	36.65	577
CAREER (TAFMS=1)	.70	6	108	17.56	115
CAREER (TAFMS=2)	.72	5	132	27.84	138
CAREER (TAFMS=3)	.82	8	52	13.21	61
CAREER (TAFMS=4)	.84	8	76	22.34	85
CAREER (TAFMS=5)	.62	5	171	21.35	177
HOPPOCK	.62	5	544	67.10	550
INSTN	.34	4	557	17.97	562
OCCPN	.63	12	563	30.11	575

[a] Variable name abbreviations are described in Table VI.
The number of predictors available to each regression is 40 combined AFIVs and CVIVs except for HOPPOCK which is 20 AFIVs.

[b] Reg = Regression degrees of freedom.
Res = Residual degrees of freedom.

Table XIII

Significant Predictors in the Stepwise Regression on CAREER[a]

	Variable[b]	Associated Outcome	Std Beta[c]	F[c]	Multiple R
Total Sample n=577	AFIV14	SELF.FULFILL	.31	71.96	.45
	CVIV14	SELF.FULFILL	-.17	20.53	.51
	AFIV20	FAMILY.OPIN	.21	35.84	.57
	AFIV12	RETIREMENT	.13	16.86	.59
	CVIV20	FAMILY.OPIN	-.14	16.17	.60
	AFIV15	MOBILITY	.10	8.15	.61
	CVIV3	HIGH.$	-.10	9.74	.62
	AFIV8	DISCIPLINE	.10	8.21	.63
	CVIV12	RETIREMENT	-.11	10.44	.64
	AFIV19	FAMILY.SEP	.08	4.95	.64
	CVIV16	RECOGNITION	.07	4.26	.65
TAFMS=1 n=115	AFIV14	SELF.FULFILL	.47	20.56	.49
	CVIV3	HIGH.$	-.37	26.97	.58
	CVIV14	SELF.FULFILL	-.31	19.67	.62
	AFIV2	$.FOR.PERF	.23	8.55	.66
	CVIV6	PROMOT.PERF	.19	6.55	.69
	AFIV10	PERS.GROWTH	.19	5.13	.70
TAFMS=3 n=61	AFIV11	JOB.CHALLNG	.38	32.62	.52
	AFIV8	DISCIPLINE	.26	16.45	.61
	AFIV15	MOBILITY	.28	20.41	.68
	CVIV11	JOB.CHALLNG	-.17	7.96	.70
	AFIV20	FAMILY.OPIN	.15	4.89	.72

Table XIII (Cont'd)

	Variable[b]	Associated Outcome	Std Beta[c]	F[c]	Multiple R
TAFMS=3 n=61	AFIV14	SELF.FULFILL	.49	21.15	.50
	CVIV20	FAMILY.OPIN	-.19	4.38	.63
	AFIV8	DISCIPLINE	.27	8.09	.67
	AFIV4	JOB.SECUR	-.37	16.06	.73
	CVIV14	SELF.FULFILL	-.23	6.60	.76
	CVIV4	JOB.SECUR	.26	8.08	.78
	AFIV12	RETIREMENT	-.22	5.82	.80
	AFIV20	FAMILY.OPIN	.19	4.18	.82
TAFMS=4 n=85	AFIV20	FAMILY.OPIN	.30	14.72	.56
	AFIV7	PERF.APPRAIS	.27	14.88	.65
	CVIV2	$.FOR.PERF	-.28	14.28	.71
	AFIV12	RETIREMENT	.24	11.73	.77
	AFIV11	JOB.CHALLNG	.19	7.07	.80
	CVIV14	SELF.FULFILL	-.31	11.74	.81
	AFIV13	AUTONOMY	.17	6.76	.83
	CVIV18	UTILIZATION	.21	4.45	.84
TAFMS=5 n=177	AFIV20	FAMILY.OPIN	.29	19.16	.47
	AFIV14	SELF.FULFILL	.32	25.28	.54
	CVIV20	FAMILY.OPIN	-.22	13.82	.59
	CVIV4	JOB.SECUR	-.20	10.35	.61
	AFIV12	RETIREMENT	.16	7.27	.62

[a]Each of the regressions was halted when the significance of the next variable to enter fell below the .05 level; i.e., an F value between 3.89 and 4.0 depending on sample size.

[b]Predictor set was composed of all AFIVs and CVIVs.

[c]Values at the termination of the regression.

Table XIV

Significant Predictors in the Stepwise Regression on Remaining Criteria[a]

	Variable	Associated Outcome	Std Beta[b]	F[b]	Multiple R
HOPPOCK[c] Total Sample n=550	AFIV14	SELF.FULFILL	.33	45.92	.55
	AFIV11	JOB.CHALLNG	.25	31.27	.59
	AFIV18	UTILIZATION	.22	23.81	.61
	AFIV17	PRESTIGE	-.11	7.06	.61
	AFIV19	FAMILY.SEP	-.07	4.57	.62
INSTN[c] Total Sample n=562	AFIV8	DISCIPLINE	.27	41.28	.30
	AFIV11	JOB.CHALLNG	.41	10.11	.32
	CVIV13	AUTONOMY	-.09	4.76	.33
	AFIV13	AUTONOMY	-.09	4.15	.34
OCCPN[c] Total Sample n=576	AFIV18	UTILIZATION	-.15	12.75	.41
	CVIV13	AUTONOMY	.19	28.83	.49
	AFIV10	PERS.GROWTH	-.16	17.94	.54
	AFIV7	PERF.APPRAIS	-.14	13.35	.56
	AFIV20	FAMILY.OPIN	-.11	8.79	.58
	CVIV5	PROMOT.ABIL	.06	2.51	.59
	CVIV15	MOBILITY	.10	8.11	.60
	AFIV2	$.FOR.PERF	-.10	7.16	.61
	AFIV12	RETIREMENT	-.10	7.73	.61
	AFIV9	QUAL.LDRSHIP	-.10	6.21	.62
	CVIV7	PERF.APPRAIS	.08	4.30	.62
	CVIV2	$.FOR.PERF	.08	4.24	.63

[a] Each of the regressions was halted when the F value for the next variable to enter fell below 3.84 or 4.0 ($p > .05$), depending on sample size.

[b] Values at the termination of the regression.

[c] Predictor set for HOPPOCK regression was AFIVs only; for INSTN and OCCPN the set was AFIVs and CVIVs.

regressions the IV product terms are complex black boxes that are composed of one of two types of instrumentality (Air Force or civilian), a valence, and are associated with a career outcome. The primary goal of interpretation is to determine the impact of the 20 career outcomes on career intent. These outcomes are indirectly related to career intent through the IV product terms in the regressions. In general, the only outcomes to be considered are those associated with significant predictors.

The situation still remains complex. The outcomes are each associated with one valence and two instrumentalities, all of which have their own relationship with career intent. In addition, these three factors make up two IV product terms that are associated with the outcome and either or both of them may appear as significant in the regression. An example of the possible problems is the AFIV19 term from the regression on CAREER for the total sample in Table XIII. AFIV19 is associated with the outcome of family separation and has a positive beta in the regression. If a direct link between the IV product term and the outcome were assumed, then one conclusion might be that career intent tends to rise with the amount of family separation.

Intuitively, this does not seem plausible; however, a more accurate interpretation requires examining the IV product term components and their behavior with respect to their Expectancy Theory basis. First, the previous conclusion is extremely unlikely since the mean for the valence of family separation is -3.41 (see Table XVI, Appendix E) and over 87 percent of the total sample found it undesirable to some degree. A more likely interpretation of this outcome is that people with less aversion to family separation tend to express a higher career intent.

The entire question of interpretation is complex and has, to the knowledge of this writer, not been dealt with in any other study. Consequently, the principal discussion of interpretation of across-person results is deferred to Chapter V.

V. Summary, Discussion, and Conclusions

Discussion of Results

At the outset of the analysis, the measure of expectancy for the attainment of specific careers were shown to be invalid and Expectancy Theory model formulations that include an expectancy component were discarded. It is important to note that failure of the expectancy measure here does not imply a weakness in the underlying theory. Rather, the expectancy measures designed for this survey are not psychometrically valid, i.e., they have not captured the particular expectancy embodied in this study. It is possible that asking a person in the first four years of a career to speculate on the chances for completing 20 years exceeds the information processing capabilities of most people.

In addition, within- and across-person tests of the model using different combinations of instrumentality and valence terms showed that the instrumentality-valence (IV) product terms did not produce significantly better results than did instrumentality terms alone; however, the product terms were retained for conceptual reasons.

Predictive Test and Analysis Results for Career Intent. The ability of the model to predict career intent was first tested within-person followed by an across-person analysis of the 40 Air Force and civilian instrumentality-valence (IV) product terms associated with the 20 career outcomes (see Table V) chosen for this study. The within-person test consisted of correlating the career attractiveness score (TOTALV) from the model with the career intent criterion (see Table X). For the total sample, which included officers with less than one year to more than four years of service, the resulting correlation coefficient (r)

was .52 ($p < .01$). It was anticipated that the accuracy of the career intent criterion (CAREER) would increase with time in service. The data revealed this to be the case, and throughout the study the portion of the sample with three to four years to total service (TAFMS=4) produced the best results. The correlation for this group (TOTALV with CAREER) produced an r of .73 ($p < .01$). For the group over four, the number of undecided responses for career intent decreased but the predictive ability of the model also dropped. Passing four years means passing a point of voluntary and involuntary separation, which may be referred to as a career decision point. It is possible that passing this decision point affects the perceptions of an individual concerning the various career outcomes used in this study.

The Expectancy Theory model weights all the IV product terms equally in the predictive calculations. A large body of psychological and decision-making research has indicated that this assumption of equal weighting is not necessarily valid. The across-person analysis (a stepwise multiple regression) examines the behavior of the IV product terms to determine the strength of their association with the CAREER criterion outside the Expectancy Theory paradigm (see Table XII).

The multiple correlation coefficient (R) from the regression, using the total sample, was .65. The seven most significant IV product terms were associated with five career outcomes (Table VIII): (1) a feeling of accomplishment and self-fulfillment as a result of their work (AFIV14 and CVIV14), (2) a favorable opinion on the part of the person's immediate family (AFIV20 and CVIV20), (3) the Air Force retirement program (AFIV12 and CVIV12), (4) frequent PCS moves (AFIV15), and (5) a high salary (CVIV13). For the TAFMS=4 group, the regression produced an R of

.84, which accounts for 71 percent of the variance in the career intent criterion. The top five most significant IV product terms were associated with the following: (1) a favorable opinion on the part of the immediate family (AFIV20), (2) a fair and unbiased performance appraisal system (AFIV7), (3) compensation based on performance (CVIV2), (4) an Air Force-type retirement program (AFIV12), and (5) an interesting and challenging job (AFIV11).

The IV product terms used in the regressions are composed of a measure of desire for an outcome (valence) and a measure of the association of the outcome with a specific career (instrumentality). The association was measured for each career alternative (Air Force or civilian). The symbols in parenthesis following the outcomes listed above indicate the instrumentality used (AF or CV) and the associated outcome identified by the one or two digit suffix. When both an AFIV and CVIV term are present, it indicates that both were significant in the regression though only one of them may have been in the top five or seven.

The association of a career outcome with a significant IV product term indicates that the outcome has some importance in the decision to remain in uniform or to separate. However, there is some additional information available to the observer regarding the actual role of the outcome in the decision process as a result of the instrumentality-valence interaction in the significant term. The Expectancy Theory concept of the IV product term is that it contributes to the force leading a person toward or away from a particular alternative in a behavioral choice situation. This property can be utilized in analyzing the results of the regressions.

For example, the total sample regression showed AFIV14 and CVIV14 to be significant predictors. Outcome 14 is a feeling of accomplishment and self-fulfillment. The question is how is the career decision influenced by these predictors. The correlation of the valence or desire for the outcome (VAL2L14) with CAREER is not significant (Table XXV, Appendix F). The mean of this valence is 4.54 on a scale from -5 to +5 with a standard deviation of .87. It is not surprising that the correlation is not significant; this term is practically a constant indicating a uniformly high desire for this outcome across the entire population.

The Air Force instrumentality of this outcome (AFINS14) has a mean of 1.08 and a standard deviation of 2.88 (Table XVIII, Appendix E) indicating that, overall, the Air Force is thought to provide jobs that offer at least some feelings of self-fulfillment and accomplishment. The civilian instrumentality (CVINS14) has a mean of 2.06 with a standard deviation of 1.76, indicating that this group of scientists and engineers felt that civilian employment would offer them more self-fulfillment than the Air Force. The correlations of AFINS14 and CVINS14 with CAREER were .47 and -.26, respectively, and both were highly significant. It would appear from these statistics that an individual will tend to prefer the career that offers the higher level of self-fulfillment and accomplishment, and the perception seems to be that a civilian career offers the higher level.

This same interpretation approach can be applied to all the significant variables, such as the Air Force retirement program (20-year retirement with a 50-percent annuity). The significant terms were AFIV12 and CVIV12. Their component statistics appear as follows:

VAL2L12 - mean 3.15; standard deviation 1.89;
r = .27 (p < .01).

AFINS12 - mean 1.08; standard deviation 2.88;
r = .15 (p < .01).

CVINS12 - mean -1.43; standard deviation 2.56;
r = .01 (not significant).

The valence mean indicates that the desire for the outcome is relatively high. The Air Force instrumentality indicates that this outcome is associated with the Air Force, but it is not as high as might be expected conceptually. this may be the result of the proposals for changes in the system. The mean for civilian instrumentality indicates that this outcome is generally not thought to be available in a civilian career.

The overall effect is the generation of a force towards an Air Force career composed of two complementary forces: an attraction toward the Air Force because of its retirement system and a force away from a civilian career because of its lack of a comparable system. The result of this complementary combination is an overall force stronger than one produced by either of the IV products by themselves. A similar interpretation methodology can be used with the results of the following analyses.

In addition to career intent, within-person and across-person analyses were also done for job satisfaction, institution orientation, and occupation orientation. Job satisfaction utilized only the AFIV terms in the analyses and had a within-person r of .42 and an across-person R of .62. The three most significant terms were associated with the following outcomes for job satisfaction (see Table XIV): (1) a feeling of self-fulfillment and accomplishment (AFIV14), (2) an interesting and challenging job (AFIV11), and (3) utilization of abilities and training (AFIV18).

The institution-orientation analyses yielded a within-person r of .17 and an across-person R of .34 based on an available predictor set of all 40 AFIV and CVIV terms. The three significant IV product terms (see Table XIV) represented: (1) discipline (AFIV8), (2) an interesting and challenging job (AFIV11), and (3) job autonomy (CVIV13). For occupation orientation, the within-person r was -.57 and the across-person R was .63, again based on all 40 terms.

The majority of the significant predictors in the across-person results for occupation had negative betas (see Table XIV), which is consistent with the negative correlation from the within-person analysis. This is not apparent from the multiple regression R which is always positive. The three most important career outcomes were: (1) utilization of training and abilities (AFIV18), (2) job autonomy (CVIV13), and (3) personal growth (AFIV10).

Summation of the Predictive Evidence. It seems worthwhile to this writer to stand back and examine the predictive results of this study from a macro viewpoint. According to Behling and Starke (1973a) Expectancy Theory is descriptive rather than prescriptive, i.e., the theory purports to describe how people actually behave in pursuing their goals rather than prescribing how they should behave to reach them. One of the basic premises of Expectancy Theory is that the goal people inherently strive for is the maximization of the attainment of those things that are desirable and minimization of the attainment of those things that are undesirable. In short, it assumes that people behave in such a way as to promote their self-interest.

The components of the model reflect this concept in their design, and these components performed relatively well both in the within- and

across-person analyses in predicting career intent. This suggests that the people in the sample population are behaving on the basis of self-interest. This opinion is supported by the correlation of the occupation orientation measures with the Expectancy Theory model and with the career intent criterion.

Tables XI and XII (Chapter IV) and Table XXIII (Appendix F) show these relationships. In all of the relationships depicted in these tables, the association of institution orientation with the predictors and other criterion is always less than the association of occupation orientation with the same variables. In the majority of cases the difference is significant. These findings lead to this writer's conclusion that the scientists and engineers in today's Air Force are influenced to a measurable degree in their career decisions by self-interest. Assuming that there is some validity to this conclusion, it remains to be seen whether or not the private sector will compete on this basis (i.e., catering to self-interest) for these people, and whether or not they will ultimately attract the greater share of this human resource as they appear to be doing now.

Methodological Limitations and Discrepancies

Certain results of the across-person analysis warrant further discussion with respect to Mitchell's (1974) remarks concerning the possibility that subjects are including some forms of valence assessment with their estimate of instrumentality. It is also possible that the reverse of this occurs; a first-level outcome association (instrumentality) may be involved in some perceptions of desirability (valence).

This issue came to light in this study while examining the results of the across-person analysis of career intent. Certain of the

significant instrumentality-valence (IV) product terms were found to contain an instrumentality or valence component that was significantly related to career intent while the other component was not. For example, in the total sample regression (see Table XIII) the Air Force predictor related to frequent PCS moves (AFIV15) was significant in this regression. Examination of the correlation for the instrumentality component (AFINS15) with career intent (Table XXVI, Appendix F) shows an $\underline{r}$ of -.08, which is not significant at the .05 level. The valence component (VAL2L15), however, shows an $\underline{r}$ of .30, which is significant at the .01 level. Overall, the IV product term is correlated with career intent with an $\underline{r}$ of .25, which is also significant at the .01 level.

Considering the statistical principles underlying multiple regression, the correlations above suggest that the significance and magnitude of the correlation between AFIV15 and career intent come principally from the variance and covariance of the valence component (VAL2L15). If this is indeed the case, then there is an empirical issue to be addressed.

From a statistical standpoint, a person's intention to remain in the Air Force or to not take a civilian job tends to increase with increasing desire or lessening aversion to frequent moves. From an Expectancy Theory standpoint, the concept of valence is independent of any particular career or job. Yet, the correlation indicates a significant association between valence and career intent. This type of association is characteristic of instrumentality; thus, it would appear that some of the valences actually contain an associational component related to instrumentality.

In Table XXV there are several valence terms that for one group or another are significantly correlated with career intent. Of these,

VAL2L8 (discipline defined along military lines), VAL2L12 (the Air Force retirement program), and VAL2L15 (frequent PCS moves) are significant for almost every group. All three of these outcomes are defined in terms that would tend to associate the outcome with the Air Force to someone currently in the Air Force. As a result, these terms are probably not a fair test of the hypothesis.

However, there are other outcomes such as job security (VAL2L4) that are significant for several of the year groups and are not in any way linked by definition to a specific career. Yet, there are career associations with job security revealed by the correlations for four of the six groups, and all are significant at the .01 level. Lacking knowledge of another influence operating in the valence measure, it would seem that the desirability of job security is to some extent associated with a person's career intentions.

A similar argument can be advanced for correlations of instrumentality with career intent (Table XXVI, Appendix F). Many of the instrumentalities show significant correlations with career intent. Instrumentality is theoretically a measure of perceived association between second-level and first-level outcomes, which for Table XXVI would be between one of the 20 career outcomes and an Air Force career. Closer examination of the Air Force instrumentality for self-fulfillment (AFINS14) for the total sample shows an $\underline{r}$ of .47 significant at the .01 level.

Statistically, this indicates a tendency for people with higher scores for AFINS14 to have a greater desire to stay in the Air Force or a lesser desire to separate. It is difficult to conceive of a person leaning toward an Air Force career on the basis that the Air Force offers

self-fulfillment, if the person did not have some desire for that outcome. Thus it would appear that some element of desirability or valence is present in the instrumentality measure. The evidence of component overlap is by no means conclusive, but it does seem to support the suggestion for further research by Mitchell (1974).

Implications for Further Research

The apparent trend of the model to increase in predictive ability, until a career decision point, is open to further testing. Two major decision points are one immediately prior to becoming a captain and one just before acquiring the rank of major. The type study conducted in this research could be repeated with a sample population that extends past major in rank and time in service. It would also be desirable to design the testing methodology around a nominal career choice criterion which would allow the model to be tested with a k-way contingency table in the manner of Parker (1974) and similar to Vroom (1966). In addition to these possibilities, there are some possible new directions in measuring the model components.

The implication of the behavior of the instrumentality and valence components in the regression is one example of the methodological problems that plague Expectancy Theory research. Lawler and Suttle (1973) suggest that "...the theory has become so complex that it has exceeded the measures which exist to test it (p. 502)." Mitchell (1974) concurs:

> While it is relatively clear that expectancies, instrumentalities, and valence are significantly related to their various criteria, we really know very little about just how the relationship occurs. Our empirical tests are inaccurate representations of the overall theory. Our measures do not reflect the underlying theoretical components. Our assumptions about the combinatorial properties of the theory are basically untested (pp. 39-40).

While this study has produced evidence to support the use of the theory, it has shed little light on a solution to the problems noted by Mitchell; rather, it has simply confirmed their existence. There are, perhaps, some approaches to the methdology that will bypass some of these concerns.

One of the problems in current Expectancy Theory research is maintaining a within-person approach. There is considerable evidence that individuals do not utilize large variable sets when making decisions. The across-person analysis in this study produced significant predictors that identified outcomes ranging in number from four to eight. Certainly the set of all 20 outcomes is beyond the normal information processing capability of most people. The ability to determine the importance weighting for the outcomes based on a within-person analysis would be extremely useful in Expectancy Theory research.

A methodology of this type is described by Zedeck (1977). The approach is used in the areas of decision-making and information processing and is sometimes known as policy capturing. With this approach, the researcher does not have to rely on the subject's self-report of his decision-making behavior. Rather, the researcher can structure a decision-making instrument in such a way as to present the subject with a set of actual decisions to make.

The decision scenarios are constructed to present a variety of component configurations to the decision maker by varying the relative level or strength of the components from scenario to scenario. Ideally, all possible combinations of component levels would be presented. Each individual's set of decisions can be analyzed in a multiple regression fashion to determine the within-person weights that the individual has

implicitly assigned to each of the components. This approach has the ability to uncover decision components that are not expressly known to the decision maker.

This approach has many advantages for Expectancy Theory research, not the least of which is eliminating many of the problems stemming from self-report measures. It also permits a more complete within-person analysis.

Expectancy Theory is currently one of the most popular theories of motivation in use (Zedeck, 1977). In addition to its popularity, it has been plagued with inconsistent methodological and conceptual treatment by researchers. This writer finds himself in agreement with Behling and Starke (1973b) who concluded that enough of these questions and problems have arisen "...to justify a shift in research emphasis from extension and refinement to testing of basic interaction relationships (p. 25)" and an effort to develop valid and reliable measures of the components.

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[a]Page numbers referenced in the text of this report for articles with a DDC documentation number refer to the DDC document.

APPENDIX A

Survey Questionnaire

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35; the following information is provided as required by the Privacy Act of 1974:

a. Authority

(1) 5 U.S.C. 301, Departmental Regulations; and/or

(2) 10 U.S.C. 8012, Secretary of the Air Force, Powers and Duties, Delegation by.

b. Principal purposes. This survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information to be used in research of management related problems. Results of the research based upon the data provided will be included in published articles, reports or texts. Distribution of the results of the research, based upon the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

EXPECTANCY MODEL OF CAREER CHOICE QUESTIONNAIRE

Introduction

The purpose of this survey is to gather data to test the predictive powers of Expectancy Theory in relation to job choice. The choice under consideration is whether to pursue a career in the Air Force or to separate and establish a career as a civilian. The bulk of the questionnaire centers around 20 possible outcomes, referred to as "Career-related Outcomes", that you might attain from whatever career you may choose. In order to establish some comparability between military and civilian careers, we have defined "career" rather narrowly. Throughout the questionnaire the two career possibilities will be defined as follows:

Air Force Career - Reaching retirement eligibility by completing 20 years of active duty service and attaining the grade of at least Lt Colonel within those 20 years.

Civilian Career - An equivalent civilian career is considered to be attaining a position at least equivalent in overall salary and responsibility to a Lt Colonel in the Air Force within 20 years.

Because of the nature of the expectancy model, it is extremely important for you to answer all the questions. If you encounter a question that does not seem to apply to you, please appraise the situation implied by the question as best you can and select the answer that seems most appropriate. Please check the questionnaire over after you finish to insure that no questions have been left unanswered.

Feel free to note any comments that occur to you as you answer the questions. Your cooperation in completing this questionnaire is greatly appreciated.

PART I

In answering the following questions about yourself, please circle the appropriate response.

1. What is your present grade?

   A. 2nd Lt B. 1st Lt C. Capt

2. How long have you been on active duty?

   A. Less than 1 year
   B. At least 1 year but less than 2 years
   C. At least 2 years but less than 3 years
   D. At least 3 years but less than 4 years
   E. 4 years or more

3. What is your highest level of education?

   A. Bachelors Degree
   B. Bachelors Degree and some graduate work
   C. Masters Degree
   D. Masters Degree and some postgraduate work
   E. Doctorate

4. Which of the following best describes your marital status?

   A. Single C. Divorced E. Married
   B. Separated D. Widower/Widow

5. What is your sex?

A. Male B. Female

6. Please circle the Air Force Speciality Code (AFSC) for your career field (your duty AFSC).

A. 26XX B. 28XX C. Other

7. Please write the reviewer's rating on your three most recent controlled (subject to quota) OER's in the blanks as indicated. If you have not had three OER's, please put an "X" in the non-applicable blank(s). If you do not wish to respond, please put an "X" in all three blanks.

A. _____ Most recent OER rating

B. _____ Second most recent OER rating

C. _____ Third most recent OER rating

8. What is your career status?

A. Regular B. Career Reserve C. Reserve

PART II

This section consists of a list of the 20 Career-related Outcomes mentioned previously. Consider each outcome separately and decide how desirable or undesirable it would be to attain that outcome as a result of your career. In this section, please try to consider the outcomes <u>independently of any specific career</u>.

Indicate your desirability of attaining each outcome by circling the appropriate number on the scale following the outcome. The scale ranges from EXTREMELY UNDESIRABLE to EXTREMELY DESIRABLE with the midpoint (0) indicating that you are INDIFFERENT to the outcome. To be specific, DESIRABLE is taken to mean how much you would <u>like</u> to experience an outcome, and UNDESIRABLE means how much you would <u>dislike</u> experiencing it.

1. A salary that is commensurate with your abilities

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

2. A salary that is commensurate with your job performance

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

3. Earning the highest possible salary that you can

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

4. Job security

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

5. Promotions based on your ability

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

6. Promotions based on your job performance

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

7. A performance appraisal system that provides a fair and unbiased evaluation of your job performance

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

8. Enforcement of discipline (i.e. a set of rules and regulations governing personal behavior in areas such as: dress and appearence, and associations with other members of the organization)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

9. Fair and effective leadership and supervision

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

10. Personal growth (e.g. developing your capacities, education/training)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

11. An interesting and challenging job

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

12. A 20-year retirement program with a monthly pension of 40% of your total salary (This would be equivalent to approximately 50% of your <u>base</u> pay in the Air Force. By expressing it this way, comparisons between military and civilian pensions can be made.)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

13. Autonomy and self-direction in accomplishing your work

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

14. A feeling of accomplishment and self-fulfillment as a result of your work

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

5. Promotions based on your ability

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

6. Promotions based on your job performance

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

7. A performance appraisal system that provides a fair and unbiased evaluation of your job performance

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

8. Enforcement of discipline (i.e. a set of rules and regulations governing personal behavior in areas such as: dress and appearence, and associations with other members of the organization)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

9. Fair and effective leadership and supervision

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

10. Personal growth (e.g. developing your capacities, education/training)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

11. An interesting and challenging job

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

12. A 20-year retirement program with a monthly pension of 40% of your total salary (This would be equivalent to approximately 50% of your <u>base</u> pay in the Air Force. By expressing it this way, comparisons between military and civilian pensions can be made.)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

13. Autonomy and self-direction in accomplishing your work

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

14. A feeling of accomplishment and self-fulfillment as a result of your work

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

15. Permanent relocations every four years or less

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

16. Recognition of your achievements and accomplishments by your organization

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

17. Prestige in terms of respect, standing, and esteem in the eyes of others

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

18. Effective use of your abilities and training by your organization

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

19. Extended separation from your immediate family (if married) or from home and friends (if unmarried)

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

20. A favorable attitude on the part of your spouse (if married) or immediate family (if unmarried) regarding your career

EXTREMELY UNDESIRABLE	-5	-4	-3	-2	-1	0 INDIFFERENT	1	2	3	4	5	EXTREMELY DESIRABLE

PART III

The following statements concern the degree to which you perceive the 20 Career-related Outcomes are associated with (i.e. provided by) an Air Force career. As you evaluate each statement, please think in terms of your perception of the overall association between each Career-related Outcome and an Air Force career where career is defined as reaching retirement eligibility by completing 20 years of active duty service and having attained the grade of at least Lt Colonel.

Following each statement, please circle one of the 11 responses on the scale ranging from COMPLETELY DISAGREE to COMPLETELY AGREE that best describes the extent of your agreement or disagreement with the statement. The midpoint of the scale (0) indicates that you are UNDECIDED or have NO OPINION about the correctness of the statement and its implied association.

1. Throughout an Air Force career, your salary will be commensurate with your abilities.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

2. Throughout an Air Force career, your salary will be commensurate with your job performance.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

3. An Air Force career will provide you with the highest possible salary that you can earn.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

4. Job security is associated with an Air Force career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

5. Promotions are based on ability in the Air Force.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

6. Promotions are based on job performance in the Air Force.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

7. In the Air Force, the performance appraisal system provides a fair and unbiased evaluation of your job performance.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

8. In the Air Force, you will be subject to enforcement of discipline (i.e. a set of rules and regulations governing personal behavior in areas such as: dress and appearence, and associations with other members of the organization).

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

9. The Air Force provides fair and effective leadership and supervision.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

10. An Air Force career is associated with opportunities for personal growth (e.g. developing your capabilities; education/training).

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

11. A career in the Air Force is associated with interesting and challenging jobs.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

12. You will be able to retire from the Air Force after 20 years service with a monthly pension of 40% of your total salary (equivalent to approximately 50% of your base pay).

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

13. An Air Force career is associated with autonomy and self-direction in accomplishing your work.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

14. A feeling of accomplishment and self-fulfillment is one result of an Air Force career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

15. During an Air Force career, you will make a permanent relocation every four years or less.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

16. The Air Force recognizes the achievements and accomplishments of its members.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

17. Prestige in terms of respect, standing, and esteem in the eyes of others is associated with a career in the Air Force.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

18. Effective use will be made of your abilities and training throughout an Air Force career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

19. Extended separation from your immediate family (if married) or from home and friends (if unmarried) is one aspect of an Air Force career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

20. Your spouse (if married) or your immediate family (if unmarried) has a favorable attitude regarding you having an Air Force career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

PART IV

The following statements concern the degree to which you perceive the 20 Career-related Outcomes are associated with (i.e. provided by) a civilian career. As you evaluate each statement, please think in terms of the overall association between each Career-related Outcome and an entire civilian career where career is defined as attaining a position at least equivalent in overall salary and responsibility to a Lt Colonel in the Air Force within 20 years.

Following each statement, please circle one of the 11 responses on the scale ranging from COMPLETELY DISAGREE to COMPLETELY AGREE that best describes the extent of your agreement or disagreement with the statement. The midpoint of the scale (0) indicates that you are UNDECIDED or have NO OPINION about the correctness of the statement and its implied association.

1. Throughout a civilian career, your salary will be commensurate with your abilities.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

2. Throughout a civilian career, your salary will be commensurate with your job performance.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

3. A civilian career will provide you with the highest possible salary that you can earn.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

4. Job security is associated with a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

5. Promotions are based on ability in a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

6. Promotions are based on job performance in a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

7. In a civilian career, the performance appraisal system will provide a fair and unbiased evaluation of your job performance.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

8. In a civilian career, you will be subject to enforcement of discipline (i.e. a set of behavior in areas such as: dress and appearence, and associations with other members of the organization).

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

9. A civilian career is associated with fair and effective leadership and supervision.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

10. A civilian career is associated with opportunities for personal growth (e.g. rules and regulations governing personal developing your capabilities; education/training).

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

11. A career as a civilian is associated with interesting and challenging jobs.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

12. In a civilian career you will have a retirement program that offers a 20-year retirement with a monthly pension of 40% of your total salary.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

13. A civilian career is associated with autonomy and self-direction in accomplishing your work.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

14. A feeling of accomplishment and self-fulfillment is one result of a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

15. During a civilian career, you will make a permanent relocation every four years or less.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

16. A civilian organization recognizes the achievements and accomplishments of its members.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

17. Prestige in terms of respect, standing, and esteem in the eyes of others is associated with a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

18. Effective use will be made of your abilities and training throughout a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

19. Extended separation from your immediate family (if married) or from home and friends (if unmarried) is one aspect of a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

20. Your spouse (if married) or your immediate family (if unmarried) has a favorable attitude regarding you having a civilian career.

COMPLETELY DISAGREE	-5	-4	-3	-2	-1	0 UNDECIDED	1	2	3	4	5	COMPLETELY AGREE

PART V

The following questions concern the probabilities of completing (1) an Air Force career should you remain in the Air Force, and (2) a civilian career (as defined in the question) should you get out of the military. Please indicate your response by circling one of the 11 probabilities ranging from 0% to 100% on the scale following each question.

1. What do you think is your chance of being able to make a career of the Air Force (i.e. reach retirement eligibility by completing 20 years of service and attain the grade of Lt Colonel or higher within those 20 years) if you attempt it?

	0%	10	20	30	40	50	60	70	80	90	100%	
NO CHANCE	I	I	I	I	I	I	I	I	I	I	I	CERTAINTY
It will be impossible for me to complete such a career if I attempt it.												Without any doubt, if I attempt such a career, I will be successful.

2. What do you think is your chance of being able to make a civilian career (i.e. attain a position at least equivalent in salary and responsibility to a Lt Colonel in the Air Force within 20 years) if you attempt it?

	0%	10	20	30	40	50	60	70	80	90	100%	
NO CHANCE	I	I	I	I	I	I	I	I	I	I	I	CERTAINTY
It will be impossible for me to complete such a career if I attempt it.												Without any doubt, if I attempt such a career, I will be successful.

PART VI

The following are general questions concerning your feelings about the Air Force and your present job. For the questions with lettered responses, please circle the letter of the most appropriate response. For the questions with horizontal scales, please answer by circling a number on the scale as you have done previously.

If you are currently assigned as a student (e.g. AFIT or a tech school), please answer with respect to your previous assignment. If the student assignment is your first, please write "N/A" next to the first four questions and answer the rest.

1. Which one of the following shows how much of the time you feel satisified with your job?

   A. All the time
   B. Most of the time
   C. A good deal of the time
   D. About half of the time
   E. Occasionally
   F. Seldom
   G. Never

2. Choose the one of the following statements which best tells how well you like your job.

   A. I hate it
   B. I dislike it
   C. I don't like it
   D. I am indifferent to it
   E. I like it
   F. I am enthusiastic about it
   G. I love it

3. Which one of the following best tells how you feel about changing your job?

   A. I would quit this job at once if I could
   B. I would take almost any other job in which I could earn as much as I am earning now
   C. I would like to change both my job and my occupation
   D. I would like to exchange my present job for another one
   E. I am not eager to change my job, but I would do so if I could get a better job
   F. I cannot think of any jobs for which I would exchange
   G. I would not exchange my job for any other

4. Which one of the following shows how you think you compare with other people?

   A. No one likes his job better than I like mine
   B. I like my job much better than most people like theirs
   C. I like my job better than most people like theirs
   D. I like my job about as well as most people like theirs
   E. I dislike my job more than most people dislike theirs
   F. I dislike my job much more than most people dislike theirs
   G. No one dislikes his job more than I dislike mine

5. Which one of the following best describes your attitude toward making the Air Force a career?

   A. Definitely intend to make the Air Force a career
   B. Probably will make the Air Force a career
   C. Leaning toward making the Air Force a career
   D. Undecided
   E. Leaning toward not making the Air Force a career
   F. Probably will not make the Air Force a career
   G. Definitely do not intend to make the Air Force a career

6. What is your opinion of discipline in today's Air Force?

A. Too strict
B. Somewhat strict
C. About right
D. Somewhat lenient
E. Too lenient

7. If I left the Air Force tomorrow, I think it would be very difficult to get a job in private industry with pay, benefits, duties, and responsibilities comparable with those of my present job.

STRONGLY DISAGREE	-2	-1	0 UNDECIDED	1	2	STRONGLY AGREE

8. An Air Force base is a desirable place to live.

STRONGLY DISAGREE	-2	-1	0 UNDECIDED	1	2	STRONGLY AGREE

9. Air Force members should take more interest in mission accomplishment and less interest in their personal concerns.

STRONGLY DISAGREE	-3	-2	-1	0 UNDECIDED	1	2	3	STRONGLY AGREE

10. I wish that more Air Force members had a genuine concern for national security.

STRONGLY DISAGREE	-3	-2	-1	0 UNDECIDED	1	2	3	STRONGLY AGREE

11. More supervision of member performance and behavior is needed at lower levels within the Air Force.

STRONGLY DISAGREE	-2	-1	0 UNDECIDED	1	2	STRONGLY AGREE

12. The Air Force requires me to participate in too many activities that are not related to my job.

STRONGLY DISAGREE	-2	-1	0 UNDECIDED	1	2	STRONGLY AGREE

13. An individual can get more of an even break in civilian life than in the Air Force.

STRONGLY DISAGREE	-2	-1	0 UNDECIDED	1	2	STRONGLY AGREE

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

If you have any additional comments or suggestions, please include them on the questionnaire or in the envelope when you return it.

If you would like to receive a summary of the survey and research results you may include your name and address when you return the questionnaire or send a separate note requesting a summary to the address on the front of the return envelope.

APPENDIX B

Questionnaire Cover Letters

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

JUN 12 1978

REPLY TO ATTN OF: AFIT/ENS (Prof Michael J. Stahl, 53362)

SUBJECT: Questionnaire Concerning Attitudes Toward Career Choice (USAF SCN 78-112)

TO: Randomly Selected Scientists and Engineers

1. I am the thesis advisor for Capt Lewis who is researching career choice for a Masters thesis via the attached questionnaire. The questionnaire is designed to survey attitudes of military members toward career choice, especially those of Air Force Scientists and Engineers. Would you please help us in our research by completing the attached questionnaire?

2. Your name was randomly selected from lists provided by the Military Personnel Center (MPC). MPC has expressed considerable interest in the results of the research. We hope that these results will have some positive impact on management of the scientific and engineering career fields.

3. As soon as you complete the questionnaire, please return it in the envelope provided. Your responses will be strictly anonymous. Only myself and Capt Lewis will have access to this data. If you would like a summary of the research and its findings, please include a request with the questionnaire when you return it or send a separate request to the address on the front of the return envelope. The summary should be in the mail sometime late in September and we hope that it will serve to partially compensate you for your assistance. Thank you very much for helping us with our research.

MICHAEL J. STAHL, PhD
Asst Prof of Management
Department of Systems Management
School of Engineering

2 Atch
Letter from Capt Lewis
Questionnaire

1 Encl
Return Envelope

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

JUN 12 1978

Dear Questionnaire Recipient:

You can help me a great deal by completing the attached questionnaire. I am in the final stage of my Masters degree program at the Air Force Institute of Technology (AFIT) which involves a major research project including the writing of my thesis. The purpose of this research is to use one of the newer models of motivation, Expectancy Theory, to predict job choice. The bulk of my research work will be based on the responses to this survey.

The success of this research project using a mailed questionnaire is, of course, completely dependent upon your voluntary participation. In order to obtain really meaningful results from this survey, I need to have a very high response rate. You have been randomly selected along with the other questionnaire recipients to participate in this survey and your particular responses are especially important in order to maintain a representative sample.

Your responses to the questionnaire will be kept strictly anonymous. The data will be reported as group tabulations rather than as individual responses. There is a Survey Control Number printed on the survey, but it is used to indicate Air Force approval of this survey as a whole and does not identify any particular questionnaire.

A great deal of effort has already been devoted to this project -- by my thesis advisor, the Military Personnel Center (MPC) people assisting me, and by my fellow classmates who patiently pretested the questionnaire. It cannot, however, succeed without the cooperation of you and your fellow officers who will receive the questionnaire. Please take time (approximately 10 to 20 minutes) as soon as you can to complete the questionnaire and then return it without delay. Your participation is sorely needed and greatly appreciated.

Thank you for your assistance in this project.

Sincerely,

Logan M. Lewis

LOGAN M. LEWIS, Capt, USAF
Masters Degree Candidate
Department of Systems Management
School of Engineering

USAF SCN 78-112

Strength Through Knowledge

APPENDIX C

Letter of Support from MPC

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MILITARY PERSONNEL CENTER
RANDOLPH AIR FORCE BASE, TEXAS 78148

REPLY TO ATTN OF: DPMYAA

20 APR 1978

SUBJECT: Master's Thesis Survey (Your Ltr, 14 Apr 78)

TO: AFIT/ENS (Capt Lewis/Capt Stahl)

1. We are very interested in the retention of our junior officers, especially those in scientific and technical career fields. Research which would provide insights as to how we may motivate and retain this high quality resource would be of benefit and has our complete support.

2. Pending approval of your survey instrument, we will provide any possible support in locating junior officers in the 26XX/ 28XX career fields. The contact point for coordination of this effort will be Major Roger Vrooman. Please communicate with him at this address:

Major Roger M. Vrooman
AFMPC/DPMYAA
Randolph AFB, Texas 78148

AUTOVON: 487-2414/3818

3. Any personal data provided for your survey must be safeguarded IAW AFR 300-13, AFR 12-35, and PL 93-579.

FOR THE COMMANDER

Lawrence F. McNeil

LAWRENCE F. McNEIL, Colonel, USAF
Assistant for Personnel Plans,
Programs and Analysis

APPENDIX D

Letters to Survey Contacts

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

19 JUN 1978

REPLY TO ATTN OF: AFIT/ENS (Prof Stahl/Capt Lewis, AV 785-3362)

SUBJECT: Survey of Air Force Scientists/Engineers

TO: SAALC/MME (Col Evans)

1. I am working on a research project involving a survey that is scheduled to include some members of your organization. Dr. Stahl and I, with some assistance from the Military Personnel Center (MPC), are looking at the problem of turnover among Air Force Scientists and Engineers. We are going to apply a theory of motivation known as Expectancy Theory to model and predict the strength of a person's career intent. The components of the model will indicate the outcomes or rewards of a career that are most desired by the majority of those surveyed and the extent to which they feel the Air Force provides these outcomes.

2. The best analysis will be possible only with a good response rate from each organization surveyed. Any support that you might lend to this survey in terms of encouraging people to respond will be greatly appreciated. Past experience has shown that surveys with the acknowledged support of an organization's leadership have met with greater success than those without such support.

3. The finished thesis (completion in late September) will be available to those desiring a copy. I have included you on our mailing list to receive one copy. If you would like additional copies or need any other information, please let me know.

4. The questionnaires for SAALC should all go into the mail 20 June 1978. The questionnaires are being sent to each recipient individually. Each survey packet contains an envelope addressed to me to facilitate returning the questionnaire. Everything about completing the questionnaire should be clear and straightforward; however, if any questions should arise, please contact me.

5. Again, thank you for your cooperation.

Logan M. Lewis

LOGAN M. LEWIS, Capt, USAF
Masters Degree Candidate
Department of Systems Management
School of Engineering

Atch
MPC Letters

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

19 JUN 1978

REPLY TO ATTN OF: AFIT/ENS (Prof Stahl/Capt Lewis, AV 785-3362)

SUBJECT: Survey of Air Force Scientists/Engineers

TO: 6514 TES/TEDE (Lt Col Max I. Miller)

1. In our telephone conversation of 19 June, I briefly outlined the research that Dr. Stahl and I are conducting. Our principal concern is the turnover among Air Force Scientists and Engineers. We are going to apply a theory of motivation known as Expectancy Theory to model and predict the strength of a person's career intent. The components of the model will indicate the outcomes or rewards of a career that are most desired by the majority of those surveyed and the extent to which they feel the Air Force provides these outcomes.

2. The best analysis will be possible only with a good response rate from each organization surveyed. Any support that you might lend to this survey in terms of encouraging people to respond will be greatly appreciated. Past experience has shown that surveys with the acknowledged support of an organization's leadership have met with greater success than those without such support.

3. The finished thesis (completion in late September) will be available to those desiring a copy. I have included you on our mailing list to receive one copy. If you would like additional copies or need any other information, please let me know.

4. The questionnaires for the 6514th Test Sq are attached. I appreciate your help in distributing them. Each survey packet contains a return envelope addressed to me to facilitate returning the questionnaire. Everything about completing the questionnaire should be clear and straightforward; however, if any questions should arise, please contact me.

5. Again, thank you for your cooperation.

Logan M. Lewis

LOGAN M. LEWIS, Capt, USAF
Masters Degree Candidate
Department of Systems Management
School of Engineering

Atch
MPC Letters
Questionnaires

APPENDIX E

Tables of Descriptive Statistics

Table XV

Sample Population Classification by
Category of Demographic Variable

Demographic and Response Group	Absolute Frequency	Relative Percentage	Adjusted Percentage
GRADE			
(0) Missing	3	.5	--
(1) 2nd Lt	334	54.1	54.4
(2) 1st Lt	239	38.7	38.9
(3) Capt	41	6.6	6.7
TAFMS			
(0) Missing	3	.5	--
(1) Less than 1 yr	127	20.6	20.7
(2) 1 yr to 2 yrs	144	23.3	23.5
(3) 2 yrs to 3 yrs	66	10.7	10.7
(4) 3 yrs to 4 yrs	89	14.4	14.5
(5) More than 4 yrs	188	30.5	30.6
ED			
(0) Missing	2	.3	--
(1) Bachelors	233	37.8	37.9
(2) Bachelors & Grad Work	234	37.9	38.0
(3) Masters	107	17.3	17.4
(4) Masters and Postgrad	33	5.3	5.4
(5) Doctorate	8	1.3	1.3
MARITAL			
(0) Missing	4	.6	--
(1) Single	220	35.7	35.9
(2) Separated	2	.3	.3
(3) Divorced	20	3.2	3.3
(4) Widowed	0	0.0	0.0
(5) Married	371	60.1	60.5
SEX			
(0) Missing	5	.8	--
(1) Male	591	95.8	96.6
(2) Female	21	3.4	3.4

Table XV (Cont'd)

Demographic and Response Group	Absolute Frequency	Relative Percentage	Adjusted Percentage
AFSC			
(0) Missing	3	.5	--
(1) 26XX	104	16.9	16.9
(2) 28XX	510	82.7	83.1
OER1			
(0) Missing	191	31.0	--
(1) 1	138	22.4	32.4
(2) 2	241	39.1	56.6
(3) 3	47	7.6	11.0
OER2			
(0) Missing	282	45.7	--
(1) 1	82	13.3	24.5
(2) 2	102	16.5	30.4
(3) 3	151	24.5	45.1
OER3			
(0) Missing	363	58.8	--
(1) 1	46	7.5	18.1
(2) 2	97	15.7	38.2
(3) 3	110	17.8	43.3
(4) 4	1	.2	.4
STATUS			
(0) Missing	6	1.0	--
(1) Regular	95	15.4	15.5
(2) Career Reserve	133	21.6	37.3
(3) Reserve	383	62.1	62.7

Computed Variable	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
OER	2.06	.60	-.30	-.83	433

Table XVI

Descriptive Statistics for Second-Level Valences
($VAL2L_i$)

i	Associated Outcome	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
1	$.FOR.ABIL	3.75	1.42	-1.33	2.08	617
2	$.FOR.PERF	3.84	1.53	-2.09	5.79	617
3	HIGH.$	2.87	2.00	-.91	.93	617
4	JOB.SECUR	3.44	1.61	-1.02	.72	617
5	PROMOT.ABIL	3.97	1.42	-2.31	8.35	617
6	PROMOT.PERF	4.17	1.28	-2.75	11.84	616
7	PERF.APPRAIS	4.37	1.20	-2.69	8.70	617
8	DISCIPLINE	.38	2.77	-.28	-.81	614
9	QUAL.LDRSHIP	4.11	1.21	-1.99	5.68	616
10	PERS.GROWTH	4.37	1.13	-3.30	17.66	616
11	JOB.CHALLNG	4.62	.89	-4.69	34.83	616
12	RETIREMENT	3.15	1.89	-1.18	1.48	615
13	AUTONOMY	3.39	1.54	-1.43	3.01	615
14	SELF.FULFILL	4.54	.87	-2.94	13.57	616
15	MOBILITY	-.76	2.73	.14	-.78	617
16	RECOGNITION	3.15	1.65	-.83	.57	617
17	PRESTIGE	2.93	1.63	-.49	-.26	617
18	UTILIZATION	4.02	1.23	-2.13	7.46	617
19	FAMILY.SEP	-3.41	2.01	1.29	1.34	617
20	FAMILY.OPIN	3.39	1.69	-1.16	1.50	617

Table XVII

Descriptive Statistics for Air Force Instrumentalities ($AFINS_i$)

i	Associated Outcome	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
1	S.FOR.ABIL	-1.44	2.83	.60	-.66	617
2	S.FOR.PERF	-1.62	2.91	.71	-.57	617
3	HIGH.$	-3.73	2.31	2.25	4.54	616
4	JOB.SECUR	.74	3.17	-.42	-1.17	613
5	PROMOT.ABIL	-1.25	2.87	.34	-1.02	616
6	PROMOT.PERF	-.47	2.99	-.01	-1.21	616
7	PERF.APPRAIS	-1.77	2.56	.50	-.65	615
8	DISCIPLINE	2.89	1.94	-1.38	2.23	614
9	QUAL.LDRSHIP	.66	2.44	-.62	-.56	615
10	PERS.GROWTH	2.52	2.14	-1.39	2.04	615
11	JOB.CHALLNG	2.09	2.27	-1.10	.93	615
12	RETIREMENT	1.08	2.88	-.37	-.76	613
13	AUTONOMY	.02	2.54	-.28	-.91	617
14	SELF.FULFILL	1.02	2.42	-.70	-.14	617
15	MOBILITY	2.01	2.37	-.83	.15	617
16	RECOGNITION	1.11	2.16	-.73	.08	616
17	PRESTIGE	.90	2.28	-.62	-.18	617
18	UTILIZATION	-.71	2.70	.07	-1.06	616
19	FAMILY.SEP	1.54	2.47	-.70	-.10	617
20	FAMILY.OPIN	1.99	2.57	-.98	.23	616

Table XVIII

Descriptive Statistics for Civilian Instrumentalities ($CVINS_i$)

i	Associated Outcome	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
1	$.FOR.ABIL	1.76	2.15	-.95	.36	611
2	$.FOR.PERF	2.18	2.13	-1.15	1.03	611
3	HIGH.$	3.07	2.26	-1.62	2.39	610
4	JOB.SECUR	.08	2.36	-.11	-.61	610
5	PROMOT.ABIL	1.69	2.08	-.83	.35	611
6	PROMOT.PERF	2.38	1.86	-1.25	1.89	610
7	PERF.APPRAIS	.42	2.00	-.30	.09	611
8	DISCIPLINE	-.04	2.33	-.31	-.85	610
9	QUAL.LDRSHIP	.76	1.91	-.47	.05	610
10	PERS.GROWTH	1.56	1.91	-.59	.47	609
11	JOB.CHALLNG	2.25	1.79	-.93	.98	610
12	RETIREMENT	-1.43	2.56	.29	-.61	610
13	AUTONOMY	.85	2.25	-.42	-.55	610
14	SELF.FULFILL	2.06	1.76	-.62	.33	610
15	MOBILITY	-2.94	1.95	1.12	1.06	610
16	RECOGNITION	1.50	1.64	-.46	-.19	609
17	PRESTIGE	1.71	1.78	-.58	.29	610
18	UTILIZATION	1.97	1.94	-.89	.56	610
19	FAMILY.SEP	-3.17	1.92	1.29	1.44	608
20	FAMILY.OPIN	2.48	2.00	-.88	.86	607

Table XIX

Descriptive Statistics for Air Force Instrumentality-Valence Products ($AFIV_i$)

i	Associated Outcome	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
1	$.FOR.ABIL	-5.88	12.19	.35	-.34	617
2	$.FOR.PERF	-6.67	12.89	.48	-.42	617
3	HIGH.$	-10.36	11.46	.68	.33	616
4	JOB.SECUR	2.81	12.36	-.23	-.58	613
5	PROMOT.ABIL	-5.13	12.65	.21	-.72	616
6	PROMOT.PERF	-2.02	13.39	-.09	-.89	615
7	PERF.APPRAIS	-7.92	12.04	.35	-.60	615
8	DISCIPLINE	.56	10.30	-.35	.15	612
9	QUAL.LDRSHIP	2.78	10.67	-.57	-.20	614
10	PERS.GROWTH	11.36	10.27	-1.07	1.49	614
11	JOB.CHALLNG	9.83	10.99	-.97	.82	614
12	RETIREMENT	3.62	11.19	-.08	0.0	611
13	AUTONOMY	.58	9.82	-.30	-.03	615
14	SELF.FULFILL	4.64	11.60	-.67	.06	616
15	MOBILITY	-1.46	9.59	-.25	.75	617
16	RECOGNITION	3.50	8.40	-.60	1.41	616
17	PRESTIGE	3.14	8.47	-.31	1.12	617
18	UTILIZATION	-2.97	11.80	-.07	-.67	616
19	FAMILY.SEP	-5.06	10.71	.33	.18	617
20	FAMILY.OPIN	7.11	10.88	-.53	.36	616

Table XX

Descriptive Statistics for Civilian Instrumentality-Valence Products ($CVIV_i$)

i	Associated Outcome	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
1	$.FOR.ABIL	6.88	9.70	-.54	.31	611
2	$.FOR.PERF	8.52	9.59	-.66	.42	611
3	HIGH.$	9.00	9.93	-.39	.27	610
4	JOB.SECUR	.45	9.19	.15	.25	610
5	PROMOT.ABIL	7.08	9.13	-.44	.21	611
6	PROMOT.PERF	10.18	8.73	-.83	1.15	609
7	PERF.APPRAIS	1.90	9.14	-.25	.38	611
8	DISCIPLINE	1.45	6.77	.30	2.11	608
9	QUAL.LDRSHIP	3.08	8.32	-.40	.42	609
10	PERS.GROWTH	6.89	9.12	-.46	.67	608
11	JOB.CHALLNG	10.65	8.85	-.81	.94	609
12	RETIREMENT	-3.94	10.26	-.04	.33	608
13	AUTONOMY	3.17	8.87	-.17	.20	608
14	SELF.FULFILL	9.67	8.52	-.31	-.23	609
15	MOBILITY	2.92	10.60	.10	.32	610
16	RECOGNITION	5.11	6.66	.32	-.03	609
17	PRESTIGE	5.89	7.29	.21	.78	610
18	UTILIZATION	8.23	8.69	-.51	.33	610
19	FAMILY.SEP	11.84	10.15	-.49	-.20	608
20	FAMILY.OPIN	9.07	8.97	-.15	.11	607

Table XXI

Descriptive Statistics for Expectancies
and
Criterion Variables

Variable	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
AFEXPCT	70.65	28.24	-.95	-.01	613
CVEXPCT	82.28	20.46	-1.73	-1.73	614
CAREER (Total Sample)	4.51	1.84	.30	-.96	608
CAREER (TAFMS=1)	4.57	1.45	-.27	-.40	124
CAREER (TAFMS=2)	4.26	1.60	.01	-.77	144
CAREER (TAFMS=3)	4.26	1.80	-.22	-.94	65
CAREER (TAFMS=4)	3.74	2.09	.02	-1.42	89
CAREER (TAFMS=5)	5.12	1.96	-.72	-.81	185
HOPPOCK	18.54	4.05	-.89	.62	562
INSTN	15.23	3.70	-.11	-.17	592
OCCPN	13.62	3.28	-.23	-.18	604

Table XXII

Descriptive Statistics for the Major or First-Level Predictors

Variable	Mean	Std Dev	Skewness	Kurtosis	Valid Cases
VAL1LAF	3.22	120.82	.03	.61	599
VAL1LCV	117.92	90.88	-.09	.63	595
TOTALV	-115.40	152.01	-.50	.65	589
FORCEAF	9.32	93.34	.24	2.04	595
FORCECV	102.17	85.96	.36	.41	595
TOTALF	-93.77	129.97	-.78	1.92	583

APPENDIX F

Tables of Bivariate Correlations

Among Predictor and Criterion Variables

Table XXIII

Summary of Intercorrelations
Among Criterion Variables

	HOPPOCK	INSTN	OCCPN
CAREER (Total Sample)	.40*** n=562	.24*** n=590	-.41*** n=600
CAREER (TAFMS=1)	.50*** n-84	.35*** n-121	-.46*** n=119
CAREER (TAFMS=2)	.44*** n=141	.32*** n=140	-.35*** n=144
CAREER (TAFMS=3)	.38*** n=64	.14 n=61	-.46*** n=64
CAREER (TAFMS=4)	.41*** n=89	.16 n=84	-.61*** n=88
CAREER (TAFMS=5)	.43*** n=183	.20** n=183	-.38*** n=184
HOPPOCK		.11** n=547	-.23*** n=558
INSTN			-.20 n=587

**p < .01
***p < .001

[a]Format: Correlation Coefficient
n=Sample size after pairwise deletion of missing cases.
Variable name abbreviations are described in Table VI.

[b]TAFMS categories: "1" = 1 yr; "2" = 1 yr to 2 yrs; "3" = 2 yrs to 3 yrs; "4" = 3 yrs to 4 yrs; and "5" = 4 yrs.

Table XXIV

Summary of Intercorrelations
Among Major Predictors[a]

		VAL1LAF	VAL1LCV
Total Sample n=584	TOTALV	.80***	-.61***
	VAL1LAF		-.02
TAFMS=1 n=116	TOTALV	.76***	-.55***
	VAL1LAF		.13
TAFMS=2 n=138	TOTALV	.80***	-.59***
	VAL1LAF		.01
TAFMS=3 n=62	TOTALV	.82***	-.60***
	VAL1LAV		-.04
TAFMS=4 n=85	TOTALV	.82***	-.64***
	VAL1LAF		-.08
TAFMS=5 n=180	TOTALV	.80***	-.68***
	VAL1LAF		-.11

***$p < .001$

[a]Predictors involving expectancy have been deleted in accordance with expectancy validation findings in Chapter IV. Variable name abbreviations are described in Table VI.

Table XXV

Bivariate Correlations of Second-Level Valences with CAREER

Variable[a]	Associated Outcome[b]	CAREER					
		(Total Sample) n=602	(TAFMS=1) n=123	(TAFMS=2) n=143	(TAFMS=3) n=65	(TAFMS=4) n=87	(TAFMS=5) n=183
VAL2L1	$.FOR.ABIL	-.01	.01	-.04	-.10	.04	-.02
VAL2L2	$.FOR.PERF	-.01	.02	.02	-.15	.03	.01
VAL2L3	HIGH.$	-.04	-.19*	-.01	-.27*	-.04	.06
VAL2L4	JOB.SECUR	.20**	.38**	.02	.05	.32**	.28**
VAL2L5	PROMOT.ABIL	.09*	.23**	.04	.05	.21*	.00
VAL2L6	PROMOT.PERF	.05	.23**	.04	-.03	.02	.06
VAL2L7	PERF.APPRAIS	.07	.13	.06	-.04	.04	.06
VAL2L8	DISCPLINE	.32**	.27**	.40**	.30*	.35**	.29**
VAL2L9	QUAL.LDRSHIP	.12**	.14	.17*	-.02	.14	.15*
VAL2L10	PERS.GROWTH	.07	.13	.15	-.09	.16	.03
VAL2L11	JOB.CHALLNG	-.03	.03	-.06	-.20	.07	.02
VAL2L12	RETIREMENT	.27**	.18*	.15	.30*	.48**	.30**
VAL2L13	AUTONOMY	-.03	-.03	-.01	-.14	.09	-.04
VAL2L14	SELF.FULFILL	-.03	.01	.03	-.13	-.03	.00
VAL2L15	MOBILITY	.30**	.17*	.37**	.43**	.49**	.23**
VAL2L16	RECOGNITION	.07	.13	-.04	.08	.23*	.04
VAL2L17	PRESTIGE	.04	.00	.03	-.14	.12	.07
VAL2L18	UTILIZATION	-.03	-.04	-.12	-.12	.18	-.01
VAL2L19	FAMILY.SEP	.12**	.09	.25**	.06	.24*	.08
VAL2L20	FAMILY.OPIN	.05	.13	.09	-.07	.17	-.02

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

Table XXVI

Bivariate Correlations of Air Force Instrumentalities with CAREER

Variable[a]	Associated Outcome[b]	CAREER					
		(Total Sample) n=581	(TAFMS=1 n=115	(TAFMS=2) n=139	(TAFMS=3) n=61	(TAFMS=4) n=86	(TAFMS=5) n=179
AFINS1	$.FOR.ABIL	.22**	.23*	.27**	.12	.31**	.18*
AFINS2	$.FOR.PERF	.15**	.22*	.26**	.03	.28**	.06
AFINS3	HIGH.$	.16**	.17	.18*	.11	.35**	.10
AFINS4	JOB.SECUR	.12**	.07	-.02	-.11	.35**	.06
AFINS5	PROMOT.ABIL	.27**	.41**	.30**	.11	.46**	.18*
AFINS6	PROMOT.PERF	.24**	.36**	.30**	.15	.35**	.18*
AFINS7	PERF.APPRAIS	.19**	.24**	.13	.22	.48**	.15*
AFINS8	DISCIPLINE	-.03	.11	-.06	-.10	-.07	-.02
AFINS9	QUAL.LDRSHIP	.28**	.31**	.30**	.09	.43**	.29**
AFINS10	PERS.GROWTH	.33**	.41**	.32**	.21	.29**	.39**
AFINS11	JOB.CHALLNG	.41**	.45**	.52**	.42**	.48**	.37**
AFINS12	RETIREMENT	.15**	.26**	.12	-.08	.16	.11
AFINS13	AUTONOMY	.25**	.34**	.27**	.16	.31**	.20**
AFINS14	SELF.FULFILL	.47**	.48**	.52**	.50**	.53**	.44**
AFINS15	MOBILITY	-.08*	-.05	-.21*	.13	-.07	-.05
AFINS16	RECOGNITION	.25**	.27**	.23**	.31*	.34**	.24**
AFINS17	PRESTIGE	.29**	.32**	.30**	.27*	.34**	.31**
AFINS18	UTILIZATION	.38**	.39**	.36**	.31*	.51**	.40**
AFINS19	FAMILY.SEP	-.18**	-.08	-.27**	-.08	-.19	-.15*
AFINS20	FAMILY.OPIN	.43**	.22*	.41**	.43**	.55**	.51**

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

Table XXVII

Bivariate Correlations of Civilian Instrumentalities with CAREER

Variable[a]	Associated Outcome[b]	CAREER (Total Sample) n=581	(TAFMS=1) n=115	(TAFMS=2) n=139	(TAFMS=3) n=61	(TAFMS=4) n=86	(TAFMS=5) n=179
CVINS1	$.FOR.ABIL	-.05	-.08	.00	-.16	-.12	.01
CVINS2	$.FOR.PERF	-.11**	.00	-.10	-.16	-.31**	-.03
CVINS3	HIGH.$	-.15**	-.05	-.11	-.23	-.18	-.14
CVINS4	JOB.SECUR	-.11**	-.14	.03	.12	-.06	-.25**
CVINS5	PROMOT.ABIL	-.12**	-.09	-.10	-.31	-.07	-.12
CVINS6	PROMOT.PERF	-.11**	.09	-.07	-.28*	-.13	-.15*
CVINS7	PERF.APPRAIS	-.07	-.07	.14	-.07	-.07	-.16*
CVINS8	DISCIPLINE	.07	-.01	.04	.13	.02	.15*
CVINS9	QUAL.LDRSHIP	-.08*	-.06	.04	-.23	-.02	-.14
CVINS10	PERS.GROWTH	-.23**	-.18	-.15	-.12	-.37**	-.28**
CVINS11	JOB.CHALLNG	-.24**	-.25**	-.22**	-.22	-.27*	-.23**
CVINS12	RETIREMENT	-.01	.11	.02	.03	.07	-.10
CVINS13	AUTONOMY	-.25**	-.27**	-.11	-.32*	-.29**	-.25**
CVINS14	SELF.FULFILL	-.26**	-.24**	-.16	-.24	-.39**	-.24**
CVINS15	MOBILITY	.01	-.12	.09	-.05	.15	.01
CVINS16	RECOGNITION	-.08*	-.05	-.04	.02	-.14	-.11
CVINS17	PRESTIGE	-.15**	-.02	-.17*	-.24	-.18	-.14
CVINS18	UTILIZATION	-.21**	-.14	-.19*	-.28*	-.27*	-.18*
CVINS19	FAMILY.SEP	-.05	-.09	.13	-.08	-.11	-.10
CVINS20	FAMILY.OPIN	-.21**	-.03	-.18*	-.39**	-.43**	-.20**

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

Table XXVIII

Bivariate Correlations of AFIV Predictors with CAREER

Variable[a]	Associated Outcome[b]	CAREER					
		(Total Sample) n=577	(TAFMS=1) n=115	(TAFMS=2) n=138	(TAFMS=3) n=61	(TAFMS=4) n=85	(TAFMS=5) n=177
AFIV1	$.FOR.ABIL	.22**	.18*	.21*	.19	.34**	.21**
AFIV2	$.FOR.PERF	.17**	.21*	.22**	.08	.32**	.10
AFIV3	HIGH.$	.14**	.26**	.06	.23	.29**	.05
AFIV4	JOB.SECUR	.13**	.11	-.01	-.12	.34**	.11
AFIV5	PROMOT.ABIL	.23**	.34**	.29**	.16	.39**	.15*
AFIV6	PROMOT.PERF	.23**	.32**	.33**	.13	.35**	.16*
AFIV7	PERF.APPRAIS	.17**	.20*	.11	.23	.47**	.11
AFIV8	DISCIPLINE	.29**	.23*	.42**	.47**	.23*	.24**
AFIV9	QUAL.LDRSHIP	.25**	.27**	.28**	.08	.42**	.26**
AFIV10	PERS.GROWTH	.32**	.38**	.35**	.19	.32**	.35**
AFIV11	JOB.CHALLNG	.39**	.44**	.52**	.40**	.48**	.33**
AFIV12	RETIREMENT	.23**	.27**	.13	-.15	.43**	.24**
AFIV13	AUTONOMY	.24**	.30**	.28**	.25	.32**	.17*
AFIV14	SELF.FULFILL	.45**	.49**	.51**	.50**	.51**	.40**
AFIV15	MOBILITY	.25**	.14	.37**	.28*	.36**	.17*
AFIV16	RECOGNITION	.26**	.25**	.23**	.30*	.38**	.25**
AFIV17	PRESTIGE	.27**	.25**	.34**	.29*	.33**	.24**
AFIV18	UTILIZATION	.36**	.39**	.38**	.34**	.45**	.35**
AFIV19	FAMILY.SEP	.21**	.13	.35**	.12	.31**	.14
AFIV20	FAMILY.OPIN	.40**	.23*	.44**	.39**	.56**	.42**

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

Table XXVIII

Bivariate Correlations of AFIV Predictors with CAREER

Variable[a]	Associated Outcome[b]	CAREER					
		(Total Sample) n=577	(TAFMS=1) n=115	(TAFMS=2) n=138	(TAFMS=3) n=61	(TAFMS=4) n=85	(TAFMS=5) n=177
AFIV1	$.FOR.ABIL	.22**	.18*	.21*	.19	.34**	.21**
AFIV2	$.FOR.PERF	.17**	.21*	.22**	.08	.32**	.10
AFIV3	HIGH.$	.14**	.26**	.06	.23	.29**	.05
AFIV4	JOB.SECUR	.13**	.11	-.01	-.12	.34**	.11
AFIV5	PROMOT.ABIL	.23**	.34**	.29**	.16	.39**	.15*
AFIV6	PROMOT.PERF	.23**	.32**	.33**	.13	.35**	.16*
AFIV7	PERF.APPRAIS	.17**	.20*	.11	.23	.47**	.11
AFIV8	DISCIPLINE	.29**	.23*	.42**	.47**	.23*	.24**
AFIV9	QUAL.LDRSHIP	.25**	.27**	.28**	.08	.42**	.26**
AFIV10	PERS.GROWTH	.32**	.38**	.35**	.19	.32**	.35**
AFIV11	JOB.CHALLNG	.39**	.44**	.52**	.40**	.48**	.33**
AFIV12	RETIREMENT	.23**	.27**	.13	-.15	.43**	.24**
AFIV13	AUTONOMY	.24**	.30**	.28**	.25	.32**	.17*
AFIV14	SELF.FULFILL	.45**	.49**	.51**	.50**	.51**	.40**
AFIV15	MOBILITY	.25**	.14	.37**	.28*	.36**	.17*
AFIV16	RECOGNITION	.26**	.25**	.23**	.30*	.38**	.25**
AFIV17	PRESTIGE	.27**	.25**	.34**	.29*	.33**	.24**
AFIV18	UTILIZATION	.36**	.39**	.38**	.34**	.45**	.35**
AFIV19	FAMILY.SEP	.21**	.13	.35**	.12	.31**	.14
AFIV20	FAMILY.OPIN	.40**	.23*	.44**	.39**	.56**	.42**

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

Table XXIX

Bivariate Correlations of CVIV Predictors with CAREER

Variable[a]	Associated Outcome[b]	CAREER					
		(Total Sample) n=577	(TAFMS=1) n=115	(TAFMS=2) n=138	(TAFMS=3) n=61	(TAFMS=4) n=85	(TAFMS=5) n=177
CVIV1	$.FOR.ABIL	-.07	-.05	-.07	-.19	-.17	.04
CVIV2	$.FOR.PERF	-.12**	-.02	-.15	-.18	-.31**	.01
CVIV3	HIGH.$	-.16**	-.28**	-.09	-.23	-.17	-.11
CVIV4	JOB.SECUR	-.10*	-.08	.03	.13	-.03	-.24**
CVIV5	PROMOT.ABIL	-.10*	-.09	-.08	-.29*	-.06	-.10
CVIV6	PROMOT.PERF	-.09*	.11	-.07	-.27*	-.10	-.10
CVIV7	PERF.APPRAIS	-.05	-.05	.14	-.04	-.06	-.15*
CVIV8	DISCIPLINE	-.05	.05	-.13	.04	-.23*	-.04
CVIV9	QUAL.LDRSHIP	-.05	.01	.06	-.25	-.01	-.06
CVIV10	PERS.GROWTH	-.22**	-.16	-.13	-.13	-.34*	-.26**
CVIV11	JOB.CHALLNG	-.23**	-.22*	-.23**	-.24	-.27*	-.18*
CVIV12	RETIREMENT	-.12**	-.02	-.01	-.10	-.08	-.25**
CVIV13	AUTONOMY	-.21**	-.24**	-.11	-.29*	-.25*	-.18*
CVIV14	SELF.FULFILL	-.24**	-.23*	-.14	-.24	-.38**	-.20**
CVIV15	MOBILITY	-.24**	-.15	-.31**	-.37**	-.45**	-.15*
CVIV16	RECOGNITION	-.03	.01	-.01	.04	-.02	-.07
CVIV17	PRESTIGE	-.10*	-.01	-.14	-.20	-.03	-.13
CVIV18	UTILIZATION	-.17**	-.12	-.20*	-.27*	-.19	-.12
CVIV19	FAMILY.SEP	-.01	-.02	-.21*	.06	-.05	.06
CVIV20	FAMILY.OPIN	-.17**	.08	-.15	-.34**	-.31**	-.24**

*$p < .05$
**$p < .01$

[a]Variable name abbreviations are described in Table VI.

[b]Outcomes are described in Table V.

APPENDIX G

Table of Bases and Organizations Surveyed

Table XXX

Bases and Organizations Surveyed

Base or Station	Organization
Edwards	Air Force Rocket Propulsion Laboratory (AFRPL) USAF Test Pilot School (ASAFTPS) Air Force Test and Evaluation Center (AFTEC) 6510th Test Wing (6510 TESTW)
Eglin	Air Force Armament Laboratory (AFATL) 3426th Test Wing (3426 TESTW)
Griffiss	Rome Air Development Center (RADC)
Hanscom	Electronic Systems Division (ESD)
Hill	Ogden Air Logistics Center (OO-ALC) 6514th Test Squadron (6514 TESTS)
Holloman	6585th Test Group (6585 TESTG)
Kelly	San Antonio Air Logistics Center (SA-ALC)
Kirtland	Air Force Weapons Laboratory (AFWL)
Los Angeles	Space and Missile Systems Organization (SAMSO)
Robins	Warner Robins Air Logistics Center (WR-ALC)
Sunnyvale	Air Force Satellite Control Facility (AFSCF)
Tinker	Oklahoma City Air Logistics Center (OC-ALC)
Vandenberg	Space and Missile Test Center (SAMTEC) 10th Aerospace Defense Squadron (10 AERODS) 394th Intercontinental Ballistic Missile Test Maintenance Squadron (394 ICBMTMS) 6595th Missile Test Group (6595 MTG) 6596th Space Test Group (6595 STG)
Wright-Patterson	Air Force Institute of Technology (AFIT) Aeronautical Systems Division (ASD) Air Force Wright Aeronautical Laboratories (AFWAL) Foreign Technology Division (FTD)

VITA

Logan M. Lewis was born on 10 September 1949 in Oklahoma City, Oklahoma. He completed high school in the spring of 1967, and graduated from Oklahoma State University at Stillwater in December of 1972 with a Bachelor of Science in Electrical Engineering. That same December, he was commissioned a second lieutenant in the United States Air Force and entered active duty two months later as a pilot trainee at Vance Air Force Base, Oklahoma.

A vision deficiency eliminated him from pilot training, and he was subsequently reassigned to Keesler Air Force Base, Mississippi as an instructor in computer programming. He remained at Keesler for four years until May of 1977 when he entered the Air Force Institute of Technology as a graduate student in Systems Management.

Captain Lewis is married to the former Carolyn Heck of Oklahoma City, and they presently have one daughter, Karyn.

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This research study examines career intent, job satisfaction, and institution-occupation orientation among members of the scientific and engineering career fields (26XX and 28XX, respectively) using a model of behavioral choice and motivation known as Expectancy Theory. The combinatorial and predictive properties of the Expectancy Theory model were tested using both within-person and across-person methodologies for 20 separate career outcomes.

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In all, the Expectancy Theory model was quite powerful in predicting career intent. The within-person test yielded a bivariate correlation (r) of .52 for the total sample and .73 for the officers with three to four years of total service. The across-person test (a stepwise multiple regression) of career intent with Expectancy Theory components for the 20 career outcomes produced a multiple correlation coefficient (R) of .65 for the total sample and .84 for the three- to four-year group.

In addition to the actual predictive testing, this report includes an extensive literature review of Expectancy Theory and some analysis of the behavior of its components in the tests along with recommendations for improvement of the methodology for measuring the components.