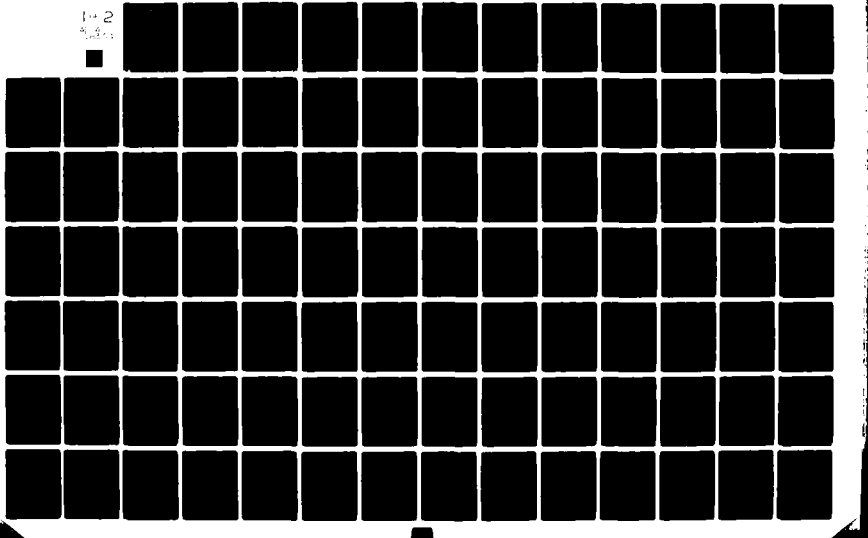
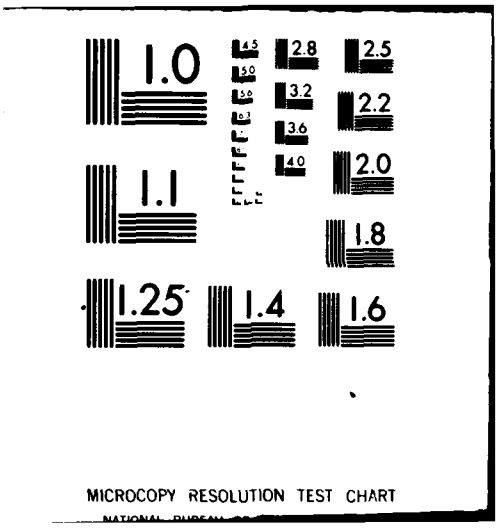
AD-A083 714 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOO--ETC F/G 5/10
A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF--ETC(U)
DEC 79 N C WAGNER
UNCLASSIFIED AFIT/GSM/SM/79D-21 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART

LEVEL II

A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF VALENCE AND FORCE

Thesis

Norbert C. Wagner, Jr.
Captain USAF

AFIT/GSM/SM/79D-21

Approved for public release; distribution unlimited.

(14) AFIT/GSM/SM/79D-21

(6) A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF VALENCE AND FORCE.

(9) Master's THESIS,

Presented to the Faculty of the School of Engineering
of the Air Force Institute of Technology
Air University (ATC)
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science

by

(10) Norbert C. Wagner, Jr.
Captain USAF

Graduate Systems Management

(11) Dec[redacted]79

(12) 120

Approved for public release; distribution unlimited.

012225

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: AFIT/GSM/SM/79D-21	2. GOVT ACCESSION NO.: AD-A083 714
3. RECIPIENT'S CATALOG NUMBER:	
4. TITLE (and Subtitle): A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF VALENCE AND FORCE	5. TYPE OF REPORT & PERIOD COVERED: Master's thesis
	6. PERFORMING ORG. REPORT NUMBER:
7. AUTHOR(s): Norbert C. Wagner, Jr. Captain USAF	8. CONTRACT OR GRANT NUMBER(s):
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Air Force Institute of Technology (AFIT/EN) Wright-Patterson AFB OH 45433	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:
11. CONTROLLING OFFICE NAME AND ADDRESS: Air Force Institute of Technology (AFIT/EN) Wright-Patterson AFB OH 45433	12. REPORT DATE: December 1979
	13. NUMBER OF PAGES: 118
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office):	15. SECURITY CLASS. (of this report): UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Approved for public release; IAW AFR 190-17

JOSEPH P. HIPPS, Major, USAF
Director of Information

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Policy capturing
Expectancy
Valence
Force
Job satisfaction
Job choice
Motivation

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

The purpose of this thesis was to examine the valence and force models of Vroom's expectancy theory of motivation. In particular, this study was designed to (1) use policy capturing to test the valence model and determine if knowledge of second-level valences increases one's ability to predict first-level valence, (2) test the force model at three levels of expectancy, 0, 0.4, and 0.8, to determine whether the function associated

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Block 20:

with expectancy has a binary (0 or 1) rather than a continuous nature, and 3) investigate the correlation between force and locus of control. (If expectancy has a binary nature, when expectancy is zero, force is zero; when expectancy is greater than zero, force is equal to first-level valence.)

One hundred fifteen Air Force Institute of Technology graduate students participated in the study. Three types of instruments were used to collect data from five different groups. All five groups received instruments related to job choice or job satisfaction; one group also received a student effort instrument. Each instrument was designed to capture valence and effort decisions in 24 different situations.

There was strong support for the valence model. In each of the six groups of data, a sum of beta-weighted instrumentalities had significantly more predictive power than a sum of equally-weighted instrumentalities.

The force model did not receive consistent support; data from the job-related exercises conflicted with data from the student effort exercises. The student effort data indicated that expectancy does have a binary nature. The job-related data indicated that first-level valence is the best predictor of force; multiplying first-level valence by either a binary or a continuous expectancy did not improve the predictive power of the force model.

Finally, no significant relationship between force and locus of control was found.

PREFACE

In my view, a master's thesis should serve two purposes. First, it should help a student learn to do research and report the findings. Second, it should represent some useful advancement of man's knowledge. I think that this thesis has served the first purpose. I hope that you, the reader, will judge that it also serves the second purpose.

I sincerely thank the three professors who helped me in my research. First, I thank Dr. Michael J. Stahl, my faculty advisor, who suggested the topic of this thesis and provided a combination of guidance and freedom that made this thesis much less of a burden than it could have been. Second, I thank Dr. Adrian M. Harrell, my reader, who made several insightful comments and suggestions. Third, I thank Dr. Charles W. McNichols, who answered many questions concerning mathematics and computer programming.

I also thank Suzanne Weber, whose patience and expertise in typing this thesis are gratefully acknowledged.

Finally, I thank my wife, Janet, for her love and support.

Norbert C. Wagner, Jr.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The purpose of this thesis was to examine the valence and force models of Vroom's expectancy theory of motivation. In particular, this study was designed to 1) use policy capturing to test the valence model and determine if knowledge of second-level valences increases one's ability to predict first-level valence, 2) test the force model at three levels of expectancy, 0, 0.4, and 0.8, to determine whether the function associated with expectancy has a binary (0 or 1) rather than a continuous nature, and 3) investigate the correlation between force and locus of control. (If expectancy has a binary nature, when expectancy is zero, force is zero; when expectancy is greater than zero, force is equal to first-level valence.)

One hundred fifteen Air Force Institute of Technology graduate students participated in the study. Three types of instruments were used to collect data from five different groups. All five groups received instruments related to job choice or job satisfaction; one group also received a student effort instrument. Each instrument was designed to capture valence and effort decisions in 24 different situations.

There was strong support for the valence model. In each of the six groups of data, a sum of beta-weighted instrumentalities had significantly more predictive power than a sum of

equally-weighted instrumentalities.

The force model did not receive consistent support; data from the job-related exercises conflicted with data from the student effort exercises. The student effort data indicated that expectancy does have a binary nature. The job-related data indicated that first-level valence is the best predictor of force; multiplying first-level valence by either a binary or a continuous expectancy did not improve the predictive power of the force model.

Finally, no significant relationship between force and locus of control was found.

A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF VALENCE AND FORCE

I. INTRODUCTION

The motivation of workers in an organization is a popular topic of study for both managers and behavioral scientists. Ivancevich, Szilagyi, and Wallace (1977) offer three reasons for this popularity. First, competition among organizations requires the efficient and effective use of resources. An understanding of worker motivation contributes to better use of the human resource. Second, many organizations find that their workers are no longer just "units" that can easily be replaced with other units from an infinite labor pool. Instead, workers are now more likely to be treated as long-term assets. Third, there is a growing recognition that workers are complex individuals motivated not only by money, but also by challenge, achievement, advancement, and other factors.

Contemporary Theories of Motivation

Mitchell (1979) divides the study of work motivation into three general areas. Each area has theories that try to answer one of three specific questions: (1) Why do we initiate effort on a task? (2) How much effort do we choose to expend?

and (3) Why do we persist in working at the task over time?

Theories that address the first question are called "content" theories. Their aim is to explain how internal needs cause individuals to act. Maslow's (1954) need hierarchy, Herzberg's (1959) two-factor theory, and Alderfer's (1972) ERG theory are three of the most widely publicized and researched content theories.

Theories that address the second question are called "process" theories. They seek to explain the process by which individuals choose among possible behavior patterns, such as a pattern of hard work or a pattern of little effort. Examples of process theories include expectancy theory, initially developed by Vroom (1964), equity theory, with which Adams (1965) is associated, and goal-setting theory, first stated by Locke (1968).

Finally, theories that address the third question are called "reinforcement" theories. Reinforcement theories are based on the work of Skinner (1938) and are operationalized through the techniques of operant conditioning, or behavior modification.

Vroom's Approach to Motivation

The focus of this paper is expectancy theory, which Victor H. Vroom first presented in 1964 when his book, Work and Motivation, was published. Vroom saw "the central problem of motivation as the explanation of choices by organisms among different voluntary responses" (1964, p. 9). Thus, Vroom's

expectancy theory is a process theory of motivation.

Before Vroom wrote his book, he made five decisions about his approach to the study of motivation. First, he restricted himself to the study of individual, not group, behavior. Second, he studied only "behaviors which affect or are otherwise relevant to the work that people perform" (1964, p. vii). Third, he decided to focus on explaining individual behavior, not on finding a way to control it. Fourth, Vroom decided to assume that individuals could account for much of their behavior in terms of (1) their preferences among the results of various behaviors and (2) the probability that certain actions will be followed by certain outcomes. Finally, he decided to restrict himself to examining data based upon objective observation.

The result of Vroom's work was a cognitive model of behavior that reflected both the concept of hedonism and the belief that behavior is ahistorical in nature. In other words, according to Vroom, a person chooses his behavior in a given situation to maximize pleasure and minimize pain, and his choices can be "explained in terms of his motives and cognitions at the time he makes the choice" (1964, p. 15).

Actions and Outcomes

In understanding expectancy theory, it is helpful to understand the difference between "actions" and "outcomes." Vroom defined an action as "behavior which might reasonably be expected to be within the repertoire of the person, e.g.,

seeking entry into an occupation." Outcomes are "more temporally distant events which are less likely to be under complete behavioral control, e.g., attaining membership in an occupation" (1964, p. 19). Although the distinction between actions and outcomes is not an absolute one, independent definitions are useful.

The Concept of Valence

Valence. Vroom used the term "valence" to describe "affective orientations toward particular outcomes" (1964, p. 15). In other words, valence is a person's desire for, or attraction toward, an outcome. It is essentially the same as what earlier authors had called "incentive," "attitude" and "expected utility." Furthermore, valence, which is based upon anticipated satisfaction, is distinct from value, which is the actual satisfaction that results from an outcome.

The valence of an outcome can be any numerical value. An outcome has (1) positive valence if a person would prefer to attain that outcome; (2) a negative valence if the person would prefer to avoid that outcome; and (3) a valence of zero if the person is indifferent to that outcome. Since valence relates to individual preferences, the valence of a particular outcome may be positive for one person, negative for another, and zero for yet another.

Instrumentality. Vroom suggested that "means acquire valence as a consequence of their expected ends" (1964, p. 16). In other words, although an outcome may have one valence in and of itself, it usually has another valence because it is

instrumental in attaining other outcomes. For example, consider people who dislike their jobs. If they know that by performing their jobs well they will be able to earn enough money to do things they like, they will attribute a positive valence to the first outcome, performing well, because it is instrumental in attaining a positively valent second outcome, doing things they like. If performing well did not lead to a positively valent second outcome, an individual would probably attribute a much lower valence to performing well.

Instrumentality is an outcome-outcome association that can have values from -1 to +1. A value of -1 indicates a belief that attaining a first outcome is a necessary and sufficient condition for not attaining a second outcome. Conversely, a value of +1 indicates a belief that attaining a first outcome is a necessary and sufficient condition for attaining a second outcome. A value of zero reflects a belief that attaining a first outcome does not affect the attainment of a second outcome.

Proposition 1. Vroom stated the following proposition, known as the valence model, which relates the valences and instrumentalities of outcomes:

> 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.

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

$$f_j' > 0; i I_{jj} = 0$$

where V_j = the valence of outcome j

I_{jk} = the cognized instrumentality ($-1 \leq I_{jk} \leq 1$) of outcome j for the attainment of outcome k

(1964, p. 17)

The Concept of Expectancy

In most situations where an individual must choose between alternative actions, there is an element of risk. Usually the outcomes of an action depend not only upon the individual, but also upon factors over which the individual has no control. Risk is hypothesized to affect behavior, and Vroom uses the term "expectancy" to describe the individual's perception of risk.

Expectancy is "a momentary belief concerning the likelihood that a particular act will be followed by a particular outcome" (Vroom, 1964, p. 17). It is a subjective probability that describes an action-outcome association. Like other probabilities, it can only have values from 0 to +1. A value of 1 indicates a "subjective certainty that the act will be followed by the outcome," while a value of zero indicates a "subjective certainty that the act will not be followed by the outcome" (Vroom, 1964, p. 17).

The Concept of Force

Vroom assumed that a person's behavior is the result of a field of forces, each of which has direction and magnitude. Vroom's concept of force is similar to what earlier authors had

called the "performance vector," "aroused motivation," "subjective expected utility," and "behavioral potential."

Proposition 2. On the assumption that "choices by people are subjectively rational" (1964, p. 18), Vroom hypothesized that valences and expectancies combine multiplicatively to determine an individual's motivational force to act. Vroom expressed his force model in the following proposition:

> 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.

$$F_i = f_i\left[\sum_{j=1}^{n}(E_{ij}V_j)\right] \quad (i = n + 1 \ldots m)$$

$$f_i' > 0;\ i \cap j = \Phi,\ \Phi \text{ is the null set}$$

where F_i = the force to perform act i

E_{ij} = the strength of the expectancy ($0 \leq E_{ij} \leq 1$) that act i will be followed by outcome j

V_j = the valence of outcome j

(1964, p. 18)

This implies that there is no force to perform an act if either expectancy or valence is zero. If both are nonzero, the magnitude of the force is increased by increasing either the expectancy or the valence, and the direction of the force is determined by the sign of the valence of the first level outcome.

Expectancy Model Illustration. Figure 1 illustrates how college students might use expectancy theory to decide how hard they will study. The "act" is studying to attain a

Force to Perform Act_i		Expectancy		First-level Outcomes	Valence of First-level Outcomes	Instrumentality		Second-level Outcomes	Valence of Second-level Outcomes
(F_i)		(E_{ij})		(O_j)	(V_j)	(I_{jk})		(O_k)	(V_k)
				"A" level		+0.8	x	Good Job	8
+5.1	=	0.3	x	Grade Point	+16.9	+1.0	x	Graduate School	10
				Average		+0.1	x	New Car	5
				"B" level		+0.6	x	Good Job	8
+8.0*	=	0.6	x	Grade Point	+13.3	+0.8	x	Graduate School	10
				Average		+0.1	x	New Car	5
				"C" level		+0.5	x	Good Job	8
+2.8	=	0.8	x	Grade Point	+ 3.5	0	x	Graduate School	10
				Average		-0.1	x	New Car	5
				"D" level		+0.2	x	Good Job	8
-3.9	=	1.0	x	Grade Point	- 3.9	-0.5	x	Graduate School	10
				Average		-0.1	x	New Car	5
				"F" level		-0.5	x	Good Job	8
-14.5	=	1.0	x	Grade Point	-14.5	-1.0	x	Graduate School	10
				Average		-0.1	x	New Car	5

Key: Act_i - putting forth effort to attain $Outcome_j$
* - Greatest Force is to do "B" level work.

Figure 1. Expectancy Model Illustration (adapted from Hamner and Organ, 1978, p. 145)

particular grade point average (GPA). The first-level outcome is actual attainment of a GPA. The second-level outcomes are the results of attaining a particular GPA, such as getting a good job, being admitted to graduate school, or being able to buy a new car. Students who find themselves in a situation illustrated in Figure 1 will study in the hopes of attaining a "B" level GPA because that act has the greatest force.

Although many researchers have tested expectancy theory, at least three issues are unresolved. First, has Vroom's theory been properly tested? Second, are the valence and force models accurate? Finally, what factors cause force to vary from person to person?

Related Literature

Expectancy theory research has dominated the literature of motivation since Vroom made the first explicit model formulations of expectancy theory in 1964. According to Stahl and Harrell (1979), eight reviews of the literature published between 1971 and 1977 have summarized the results of approximately 100 empirical studies of expectancy theory. Not only has Vroom's original model been the subject of much research, but several modifications to the original model have been proposed and tested.

Theoretical Issues. House, Shapiro, and Wahba (1974) describe four major modifications to the original model: 1) a distinction between first and second level outcomes, 2) a recognition of intrinsic sources of valence, 3) a redefinition

of expectancy into two types, and 4) an elaboration of the model to include additional variables. Only the first three modifications significantly change the original model. In addition, these modifications affect primarily the force model and leave the valence model unchanged (Mitchell, 1974). The need for these modifications, which caused Lawler and Suttle (1973) to suggest that "the theory has become so complex that it has exceeded the measures which exist to test it" (p. 502), may not have been due to actual theoretical shortcomings in the original model, but rather due to perceived theoretical shortcomings caused by inadequate methodology.

Methodological Issues. The methodological issues concern three main areas: 1) measuring valence, instrumentality, and expectancy, 2) the number, source, and valence of second-level outcomes, and 3) within-person versus across-person testing. Because of these issues, Mitchell (1974) said

> Changing and modifying the theory seems premature. That is, before we reject Vroom's original formulation, we should correctly test it (p. 1075).

Research to resolve these methodological issues has been only moderately successful. In addressing the first issue, DeLeo and Pritchard (1974) suggest that surveys, upon which much expectancy research has been based, are inadequate. Researchers addressing the second issue have used as many as 51 second-level outcomes in their testing, but Eran and Jacobson (1976), who used 35 second-level outcomes, found that only three outcomes were significant in their test of the valence

model. And Matsui and Ikeda (1976), who examined the issue of whether self-generated outcomes were superior to a standard list of outcomes, failed to discover a statistically significant difference between the types of outcomes. Reinharth and Wahba (1976) found that including both positive and negative second-level outcomes in the model did not improve the predictive power of expectancy theory. Finally, Muchinsky (1977) addressed the last issue and concluded that expectancy theory has greater utility as a within-person predictor of behavior than as an across-person predictor.

Policy Capturing and the Valence Model. Implicit in Mitchell's imperative to correctly test Vroom's original model is the question of what he means by "correctly." Mitchell and Beach (1977) provide an unambiguous answer to this question--use policy capturing.

> . . . policy capturing models . . . should be applied more often [in expectancy theory research]. They are highly similar to Expectancy Theory. . . they are used in investigating much the same kinds of issues--the way in which, and the degree to which, various considerations influence people's evaluations of situations, objects, and events. (p. 213)

Policy capturing is a technique of behavioral decision analysis that uses multiple linear regression to model human judgment. Extensive literature reviews by Slovic and Lichtenstein (1971), Kaplan and Schwartz (1975), Slovic, Fischoff, and Lichtenstein (1977), and Hammond, Rohrbaugh, Mumpower, and Adelman (1977) all support the idea that linear models are powerful enough to provide useful descriptions of complex human judgments.

The model most frequently specified by researchers has the following linear form:

$$Y = \beta_0 + \sum_{i=1}^{n} \beta_i X_i$$

where

Y = the decision

X_i = a cue, or factor affecting the decision

β_i = the beta weight, or importance, of X_i

β_0 = the regression constant

n = the number of cues

The ability of this model to predict a decision based upon a set of cues is summarized by a number called the coefficient of determination, R^2. (An R^2 of 0 indicates no predictive power while an R^2 of 1 indicates perfect predictive power.)

Hoffman (1960) points out three limitations to the uses of this model. First, direct comparisons of beta weights between judges are not meaningful if the judges do not have the same R^2. Second, the beta weights do not account for all of the predictable variance in the model. Finally, beta weights do not represent the <u>independent</u> contributions of each X_i to the decision.

All three of these limitations can be overcome by 1) using orthogonal cues and 2) converting the beta weights to relative weights, W_i's. Orthogonal cues, which by definition are uncorrelated, cause the sum of the squares of the beta weights to equal the coefficient of determination and thus overcome the second limitation. In equation form:

$$\sum_{i=1}^{n} (\beta_i^2) = R^2$$

The fact that the cues are orthogonal allows the conversion of the beta weights to relative weights through the following formula:

$$W_i = \frac{\beta_i^2}{R^2}$$

The relative weights overcome the other two limitations by allowing 1) meaningful comparisons of relative weights between judges and 2) an assessment of the independent contribution of each cue to a judge's decision (Ward, 1962). Thus, policy capturing provides a solution to many of the problems encountered in testing the valence model.

Two recent studies used policy capturing to test the valence model. Stahl and Harrell (1979) asked subjects to indicate the valence of hypothetical jobs described in terms of four orthogonal second-level outcomes: geographic location, family preferences about work conditions, utilization of special skills and knowledge, and chance of being promoted. Two levels of instrumentality were used, "very positive" and "very negative." Morehouse (1979) asked students to indicate the valence of working to get an "A" in an academic course described in terms of three orthogonal second-level outcomes: improved grade point average (GPA), regard of classmates, and personal satisfaction. He also used two levels of instrumentality, "very positive" and "zero." In both studies Vroom's

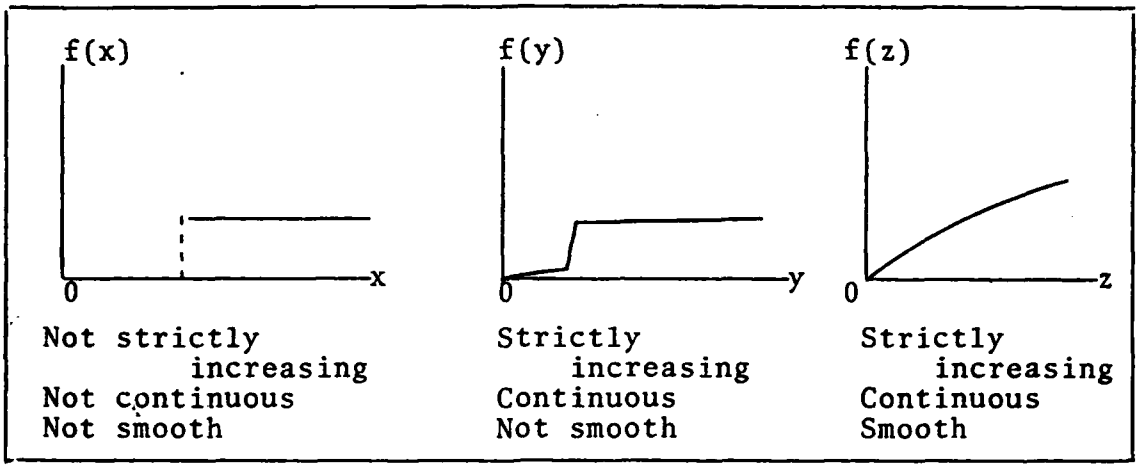


Figure 2. Examples of Monotonic Increasing Functions

original valence model was strongly supported.

Expectancy and the Force Model. Vroom states that the functions associated with both force and valence are monotonic increasing. The International Dictionary of Applied Mathematics defines "monotonic" this way:

> A sequence $a_1, a_2, \ldots,$ is monotonic increasing if $a_m \leq a_n$ when $m < n$. A function $f(x)$ is monotonic increasing if $f(a) \leq f(b)$ when $a < b$. Monotonic decreasing is similarly defined (1960, p. 620).

According to this definition, all three functions in Figure 2 are monotonic increasing.

Vroom requires in addition to monotonicity that the first derivatives of the functions associated with force and valence be greater than zero. Therefore, the force and valence functions, according to Vroom, must be 1) smooth, 2) continuous, and 3) strictly increasing. Of the functions shown in Figure 2, only f(z) meets these requirements.

Although Vroom does not explicitly specify a functional form for expectancy, Propositions 1 and 2 together imply that the function associated with expectancy is monotonic increasing with a first derivative greater than zero. The fact that "research evidence does not support the multiplicative calculation required by the [force] model before an individual is motivated to exert some effort" (Hellreigel and Slocum, 1979, p. 415) could be due to a lack of smoothness, continuity, or strictly increasing monotonicity in the expectancy function. It is possible that the functional form of expectancy is more like f(x) or f(y) in Figure 2 than f(z). That is, perhaps expectancy has a "binary" nature; in a practical sense, expectancy might take on only values of zero or one (Morehouse, 1979).

If expectancy does have a binary nature, then when expectancy is low, force is best predicted by assuming that expectancy is zero. Over some range of low values of expectancy, force is dominated by expectancy and is equal to zero. When expectancy is greater than some "threshold" level, force is best predicted by assuming that expectancy is equal to one. Over this range of higher expectancy values, force is dominated by, and proportional to, valence. Morehouse (1979), using an approach suggested by Stahl and Harrell (1979), tested the force model at three levels of expectancy -- 0, 0.4, and 0.8. His findings do, indeed, support the notion that expectancy has a binary nature.

Additional Variables. Mitchell (1979) and others note that variables outside the expectancy model may affect behavior.

For example, force may be moderated by the difficulty of the task or external pressures from friends or family. One factor that has been studied is an internal characteristic called "locus of control."

Locus of control is a concept that was introduced by Rotter in 1966 and is defined as a "personality dimension characterized by beliefs concerning one's influence or control over events occurring in the environment" (Ivancevich, et al., 1977, p. 564). Individuals with an "internal" locus of control tend to believe that they have a great deal of control over what happens to them, while those with an "external" locus of control tend to attribute events to luck, fate, or powerful others. Studies by Lied and Pritchard (1976); Mitchell, Smyser and Weed (1975); and Sims, Szilagyi, and McKemey (1976) indicate that people with an internal locus of control have higher expectancies than those with an external locus of control.

Problem Statement

The primary purpose of this research is to examine Propositions 1 and 2 of Vroom's (1964) expectancy theory. In particular, this study was designed to do three things:

1) Use policy capturing to test the valence model and determine if knowledge of second-level valences increases one's ability to predict first-level valence.
2) Test the force model at three levels of expectancy to determine if the function associated with expectancy does have a binary nature.

3) Investigate the correlation between force and locus of control.

Summary

Although Vroom's basic propositions have not yet been proven, they remain undenied (Morehouse, 1979). While methodological issues and theory modifications have confused and confounded many researchers in their efforts to test expectancy theory, policy capturing has provided a new tool which resolves some of the issues. This thesis, which builds directly upon the work of Morehouse (1979) and Stahl and Harrell (1979), re-examines Vroom's basic propositions. The chapters that follow contain a discussion of methodology, research results, and the meaning of those results.

II. METHODOLOGY

This study is essentially a replication and extension of the work done by Stahl and Harrell (1979) and Morehouse (1979). The instruments and methodology used in this study closely parallel theirs. Therefore, an extensive discussion of how the instruments were developed in not included in this chapter. Rather, the discussion here centers upon how the earlier instruments were adapted for use in this study. In addition, the subjects, the data collection procedures, and the data analysis techniques of this study are discussed.

Subjects

The subjects for this research were 115 Air Force officers who were graduate students at the Air Force Institute of Technology (AFIT) School of Engineering and School of Systems and Logistics. Most of the officers were captains, but majors and first and second lieutenants also participated in the study. The subjects had an average age of about 30 years and an average time in the service of about eight years.

By accepting an assignment to AFIT, each officer had recently made a decision relating to job choice or job satisfaction. Each officer could expect to make a similar decision prior to graduation, which for most the students was between 12 and 18 months away. Thus, these subjects were qualified by actual experience to make decisions concerning job choice and

job satisfaction. (The term "job" is used here in a narrow sense; it is not the same as "career" or "occupation.")

Instruments

Basic Format. The basic instrument used in this study was a "Decision-Making Exercise for Air Force Officers" modeled after instruments designed by Stahl and Harrell (1979) and Morehouse (1979). Appendices A, B, and C contain copies of three of the six instruments used in this study. Each of the first four instruments had an introduction followed by three sections. Section I was for the collection of demographic data; Section II contained a policy-capturing instrument; Section III contained an instrument that measured locus of control. Each section contained specific instructions for the completion of that section. The last two of the six instruments contained only an introduction, a policy-capturing section, and instructions.

Each of the policy-capturing instruments required the subjects to make 24 sets of decisions--Decision A and Decision B. First, a hypothetical first-level outcome was described in terms of a set of second-level outcomes and instrumentalities. Based on this description, the subject made Decision A, which indicated the attractiveness of the first-level outcome. Decision A corresponds to V_j in Vroom's valence model. Decision A was followed by further information concerning the expectancy of being able to attain or avoid the first-level outcome if the individual exerted a great effort to attain or avoid it. One

of three levels of expectancy, high (probability = 80%), moderate (probability = 40%), and zero (probability = 0%) was presented. After receiving this information, the subject made Decision B, which indicated the amount of effort the subject would exert to attain or avoid the outcome. Decision B corresponds to F_i in Vroom's force model.

Job Choice-Job Satisfaction. In the job choice and job satisfaction exercises, 24 hypothetical jobs were described in terms of four second-level outcomes: geographic location, family preferences for work conditions, utilization of special skills and knowledge, and chances for promotion. Two levels of instrumentality, "very positive" and "very negative," were used. The four second-level outcomes were considered by Stahl and Harrell (1979) to be more relevant to Air Force officers than other possible second-level outcomes. For example, salary was not included because an officer's salary is a function of the officer's rank and time in service and is not directly affected by the actual job the officer holds within the military service. In the job choice and job satisfaction exercises, each Decision A reflected the attractiveness of the job to the subject. The two types of exercises differed primarily in terms of Decision B.

In the job choice exercises the subjects were asked to assume that they were about to be reassigned and that each hypothetical job was vacant. Each Decision B indicated the effort a subject would exert to get or avoid a hypothetical job. In the job satisfaction exercises the subjects were asked to

assume that they presently held each hypothetical job and that they might be reassigned. Here each Decision B indicated how much effort the subject would exert to leave or remain in the hypothetical job.

Highlighted Expectancy. An analysis of the first two sets of data suggested that the subjects did not use the expectancy information, perhaps because the size of the print and its location made the information hard to read. Therefore, a second two sets of data were collected with instruments on which the expectancy word descriptions, "high", "moderate", and "zero," were marked with a yellow see-through marking pen.

After the data for the first four exercises had been collected and analyzed, interviews with some of the subjects indicated that, even though one-third of the hypothetical jobs had an expectancy of zero associated with them, the subjects did not believe that the probability of getting, avoiding, remaining in, or leaving a job was really zero if great effort were exerted. The officers' perceptions of how the USAF Military Personnel Center (MPC) operated seemed to confound the first four data collection efforts. As a result, the final data collection effort was made.

Job Choice-Student Effort. Two instruments were used in the final data collection effort. The first instrument was the student effort (SE) instrument designed by Morehouse (1979). It described getting an "A" in a course in terms of three second-level outcomes: improved GPA, regard of classmates, and personal satisfaction. Two levels of instrumentality, "zero"

and "very positive," were used. Each Decision A indicated the attractiveness of getting an "A" in a hypothetical course. As in the other instruments, one of three levels of expectancy (0, 0.4, 0.8) was then provided. Each Decision B indicated the amount of additional effort the student would exert to get an "A" in a hypothetical course. The second instrument in this data collection effort was a job choice (JC) instrument with expectancy highlighted. Demographic and locus of control data were not collected with either instrument. The student effort instrument was used because the decisions made by the subjects were not related to perceptions of MPC policies, and the job choice instrument provided a basis for comparison.

Instrument Designations. The six versions of the decision-making exercise are designated as follows:

1) Job Choice-without Highlight	JC-$\bar{H}$
2) Job Satisfaction-without Highlight	JS-$\bar{H}$
3) Job Choice-with Highlight	JC-H
4) Job Satisfaction-with Highlight	JS-H
5) Job Choice	JC
6) Student Effort	SE

Locus of Control. Each of the first four exercises contained a 15-item version of Rotter's (1966) 29-item, internal-external (I-E) locus of control instrument. The 15 items were those that, according to Cherlin and Bourque (1974) and Stahl (1979), reliably measure general control. A score of 15 on the forced-choice instrument was the maximum possible external score. One point was scored for each "A" answer to questions 1, 3, 4, 5, 9, 10, 11, 12, and 13; and each "B"

answer to the other questions (see Section III of the Job Choice Exercise in Appendix A).

Orthogonality. The job choice and job satisfaction exercises employed a half-replicate of a full factorial design. The combinations of four second-level outcomes at two levels of instrumentality and three levels of expectancy resulted in 24 hypothetical jobs ($2^4 \times 3 \times 1/2$). A half-replicate was used because 48 hypothetical jobs would have made the instruments too long to be completed in a reasonably short amount of time. Furthermore, interactions between the second-level outcomes were assumed to be negligible, so a full factorial design was not needed. The student effort exercise employed a full factorial design. The combinations of three second-level outcomes at two levels of instrumentality and three levels of expectancy also resulted in 24 hypothetical decision situations ($2^3 \times 3$). The job and course descriptions generated by these designs were randomly arranged within the policy-capturing instruments.

Expectancy Levels. The three levels of expectancy (0, 0.4, 0.8) were chosen to facilitate the investigation of the nature of the function associated with expectancy. The original job choice instrument designed by Stahl and Harrell (1979) had only two levels of expectancy, 0.2 and 0.8, both of which seem to be above the assumed binary threshold described in Chapter I. It was assumed that an expectancy of zero would be below the binary threshold and that the expectancies of 0.4 and 0.8 would both be above the threshold.

Pretesting. Because the instruments used in this study were adapted from other very similar instruments, extensive

pretesting was not conducted. Five job choice and five job satisfaction exercises were distributed to and completed by AFIT students. Interviews conducted after the exercises were completed indicated that the students had no difficulty in understanding or completing the exercises, so the instruments were distributed without revision.

Data Collection

Twenty-seven JC-$\overline{H}$ and 27 JS-$\overline{H}$ exercises were distributed to students just beginning their first quarter in the AFIT School of Engineering. None of these students had been exposed to earlier expectancy theory research at AFIT. Each student received one of the two exercises at the beginning of class one day and was asked to return the completed exercises the next day. There was no discussion of the exercises except for the statement that the results would be incorporated in a master's thesis. In all cases the completion of the exercises was voluntary and, except for those subjects who requested feedback and provided a name and address, anonymous.

After the JC-$\overline{H}$ and JS-$\overline{H}$ exercises were analyzed, 86 first-quarter students in the AFIT School of Systems and Logistics received either a JC-H or a JS-H exercise through the school's distribution system. Each exercise had a note attached requesting that the exercise be completed and placed in a designated collection box. Again, participation was voluntary and, except for those requesting feedback, anonymous.

After the JC-H and JS-H exercises were analyzed, 16

students in a research management course completed the SE and JC exercises in class as a part of their coursework. To preserve anonymity and still be able to receive personal feedback, each student marked both of the exercises with a unique numerical identifier. The SE exercise was completed first; no verbal instructions were given. The JC exercise was then distributed and verbal instructions were given in addition to the written instructions. The officers were told to assume that the expectancy information in the JC exercise had been given to them by their career advisor at MPC. If the job was attractive (Decision A greater than zero), a "high" expectancy meant that the officer would be assigned to that job if the officer exerted some effort to get the job; a "moderate" expectancy meant that the officer might be assigned to the job if effort to get the job was expended; a "zero" expectancy meant that the officer would not get the job no matter how much effort was expended. For unattractive jobs, the expectancies took on opposite meanings.

Data Analysis Techniques

Data analysis was accomplished through the use of procedures in the Statistical Package for the Social Sciences (SPSS) (Nie, et al, 1975) and a Fortran program designed to do regression analysis. (The Fortran program is presented in Appendix D.) Because the mathematical procedures used in this study are common in behavioral research, the actual mathematical computations are not discussed. Only the applications of the

of the procedures are discussed.

Frequency Analysis. A frequency analysis procedure was used to obtain descriptive statistics for 1) demographic data, such as age, rank, and sex; 2) raw numerical data, such as the values of Decision A and Decision B; and 3) calculated numerical data, such as locus of control and coefficient of determination.

Regression Analysis. The 24 attractiveness decisions (Decision A) made by each subject were regressed on the instrumentalities associated with the second-level outcomes. In performing the regression, an instrumentality of "very positive" was translated to +1, "zero" remained zero, and "very negative" became -1. The regression analysis allowed the computation of both the coefficient of determination, R^2, and the beta weight, β_1, of each second-level outcome for each subject.

The R^2 of a regression equation is a measure of internal reliability. The data from one subject who had an R^2 of less than 0.35 were discarded because that data merely added noise to the analysis. Likewise, data from twelve subjects who did not fully complete the policy-capturing instrument were not used. (These were the only two reasons for which data were discarded.)

An adjusted R^2 (Nie, et al, 1975) was calculated for each subject. The adjusted R^2 compensates for the inflation of the normal R^2 that occurs when a small number of data points is used in the regression. (With 24 data points for each subject, the difference between the normal R^2 and the adjusted R^2 is

noticeable but not significant.)

The beta weights were calculated because they represent the valence of the second-level outcomes. The use of beta weights as valences avoids an issue raised by Schmidt (1973); because the beta weights are pure numbers and the instrumentalities are stated values, they can be multiplied without error.

Correlation Analysis. The Pearson product-moment correlation, r, was a major tool of the data analysis. The square of the correlation, r^2, has the same meaning as the coefficient of determination, R^2; both represent the amount of variance one variable (or set of variables) can explain in the values of another variable. Correlational analysis was used in the investigation of all three research questions discussed in Chapter I.

Paired-Sample t-Test. The only statistical test used in this study was the paired-sample t-test of the difference between means. A grouped-data t-test would not have been appropriate because this study was designed to test expectancy theory as a within-person model of behavior, not as an across-person model.

III. RESULTS

Return Rate

One hundred seventy-two exercises were distributed; 128 were returned; 115 were usable. The thirteen that were not usable consisted of twelve that had responses missing in the policy-capturing section of the exercise and one that had an R^2 of less than 0.35. The overall response rate was 74.4%; the effective response rate was 66.9%. Table I shows the return rate information for each of the six different versions of the exercise.

Demographic Data

Demographic data for each of the first four groups of subjects are presented in Table II. Demographic data were not collected from the sixteen subjects who completed the JC and SE instruments, but all of those subjects were male and, as a group, they were not unlike the subjects in the first four groups.

Reliability

The first step in analyzing the data was to examine the reliability of the instruments by regressing the instrumentalities on the attractiveness decisions (Decisions A) and calculating the coefficient of determination, R^2, for each subject. The average R^2 for the job choice and job satisfaction exercises

TABLE I

Response Rate Summary

Instrument	JC-H̄	JS-H̄	JC-H	JS-H	JC	SE	Total
# Distributed	27	27	43	43	16	16	172
# Returned	20	19	33	24	16	16	128
Overall Response Rate	74.1%	70.4%	76.7%	55.8%	100%	100%	74.4%
# Unusable	2	1	2	7	0	1	12
# Usable	18	18	31	17	16	15	115
Effective Response Rate	66.7%	66.7%	72.1%	39.5%	100%	93.8%	66.9%

TABLE II

Demographic Data Summary

Instrument	JC-H̄	JS-H̄	JC-H	JS-H
Age	30.2 (2.1)*	29.8 (4.8)	28.8 (2.8)	30.2 (3.4)
Sex				
Male	15	16	30	17
Female	3	2	1	0
Rank				
2nd Lt	1	2	3	1
1st Lt	1	4	3	2
Capt	16	9	24	12
Major	0	3	1	2
Total Time in Service	8.2 (3.6)	8.3 (5.6)	6.7 (3.5)	7.8 (3.4)
Time in Grade	3.3 (2.1)	1.3 (0.8)	3.0 (2.7)	1.9 (1.2)

*Mean (Standard Deviation)

was 0.872; the average adjusted R^2 was 0.853; the minimum adjusted R^2 was 0.572. Twelve exercises were discarded because the policy-capturing sections had not been completed. The student effort exercises had an average R^2 of 0.687, an average adjusted R^2 of 0.686, and a minimum adjusted R^2 of 0.392. One exercise with an R^2 of 0.223 was discarded.

The high R^2s, particularly for the job-related exercises, indicate that all of the subjects were internally consistent in their decision making. Table III contains a reliability summary for each of the six versions of the policy-capturing instrument.

Test of the Valence Model

Regression Analysis. The regression performed in examining the reliability of the exercises resulted in the creation of a linear policy model, in the form of a regression equation, for each subject. The beta weights of the regression equations were treated as second-level valences. The differences in the mean beta weights, as shown in Table IV, indicate that there were within-person variances in assigning valences to the second-level outcomes. The standard deviations of the beta weights indicate the extent of the across-person variations in assigning valences to the different second-level outcomes. It is the ability of policy capturing to reveal these within-person and across-person differences in valence that makes policy capturing a powerful tool in examining the valence model.

TABLE III

Reliability Summary

Instrument	JC-$\bar{H}$	JS-$\bar{H}$	JC-H	JS-H	JC	SE
R^2	0.851 (0.095)*	0.884 (0.102)	0.882 (0.096)	0.858 (0.100)	0.882 (0.065)	0.687 (0.175)
Adjusted R^2	0.828 (0.109)	0.866 (0.118)	0.864 (0.110)	0.836 (0.115)	0.866 (0.075)	0.686 (0.159)
Maximum Adjusted R^2	0.993	0.985	1.000	0.993	0.992	0.883
Minimum Adjusted R^2	0.572	0.648	0.599	0.549	0.721	0.392

*Mean (Standard Deviation)

TABLE IV

Summary of Beta Weights and Relative Weights

Instrument	JC-$\bar{H}$	JS-$\bar{H}$	JC-H	JS-H	JC	SE
β_1	0.326 (0.191)*	0.251 (0.268)	0.347 (0.252)	0.403 (0.253)	0.297 (0.209)	0.481 (0.210)
R_1	0.164 (0.181)	0.149 (0.241)	0.205 (0.217)	0.262 (0.065)	0.148 (0.168)	0.373 (0.236)
β_2	0.283 (0.158)	0.327 (0.215)	0.219 (0.166)	0.413 (0.254)	0.471 (0.237)	0.258 (0.137)
R_2	0.123 (0.124)	0.169 (0.143)	0.087 (0.090)	0.274 (0.252)	0.311 (0.295)	0.098 (0.108)
β_3	0.233 (0.217)	0.351 (0.238)	0.388 (0.286)	0.276 (0.165)	0.327 (0.198)	0.547 (0.183)
R_3	0.115 (0.181)	0.201 (0.198)	0.260 (0.288)	0.122 (0.122)	0.163 (0.162)	0.467 (0.255)
β_4	0.675 (0.236)	0.615 (0.224)	0.586 (0.233)	0.463 (0.305)	0.487 (0.263)	--- ---
R_4	0.597 (0.293)	0.482 (0.254)	0.449 (0.293)	0.342 (0.338)	0.336 (0.287)	--- ---

*Mean (Standard Deviation)

β_i = Beta Weight

R_i = Relative Weight

Interpretation of Second-Level Outcomes:

For JC/SE Instruments:

- i = 1 - Geographic Location
- i = 2 - Family preferences for Work Conditions
- i = 3 - Utilization of Special Skills/Knowledge
- i = 4 - Chances for Promotion

For the SE Instrument:

- i = 1 - Improved Grade Point Average
- i = 2 - Regard of Classmates
- i = 3 - Personal Satisfaction

Correlation Analysis. After the regression analysis was completed, two squared Pearson product-moment correlations, r^2s, were calculated for each subject. The first was between 1) the Decisions A made by a subject and 2) the equally-weighted sums of the instrumentalities of the exercise the subject had completed. The second was between 1) the Decisions A made by the subject and 2) the individually beta-weighted sums of the instrumentalities of the same exercise. (The value of the second mean squared correlation is equal to the mean coefficient of determination, R^2.)

t-Tests. Table V contains a summary of the six paired-sample t-tests performed between the mean squared correlations. All six of the t-tests strongly support the valence model as Vroom (1964) described it in Proposition 1. In this study, the beta-weighted sums of instrumentalities hold greater predictive power than do the equally-weighted sums of instrumentalities. Individuals do, indeed, seem to 1) assign valences to second-level outcomes and 2) use those second-level valences in assigning a valence to a first-level outcome.

Tests of the Force Model

According to Vroom (1964), force is equal to the product of a first-level valence and an expectancy. In the exercises, the subjects indicated the valence of the first-level outcomes when they made Decision A. An expectancy of 0, 0.4, or 0.8 was given for each first-level outcome. The subject then made Decision B, which indicated the amount of effort a subject

TABLE V

Tests of Explained Variation in the Valence Model - Beta-Weighted Instrumentalities versus Equally-Weighted Instrumentalities

Instrument	Variables	Mean Squared Correlation Coefficient	t-value	df	Two-Tailed p
JC-$\overline{H}$	DA, BWI	0.851	8.35	17	0.000
	DA, EWI	0.584			
JS-$\overline{H}$	DA, BWI	0.884	7.40	17	0.000
	DA, EWI	0.601			
JC-H	DA, BWI	0.882	9.95	30	0.000
	DA, EWI	0.601			
JS-H	DA, BWI	0.858	7.10	16	0.000
	DA, EWI	0.614			
JC	DA, BWI	0.881	5.57	15	0.000
	DA, EWI	0.669			
SE	DA, BWI	0.687	5.57	15	0.000
	DA, EWI	0.567			

DA - Decision A, first-level valence
BWI - Sum of the beta-weighted instrumentalities
EWI - Sum of the equally-weighted instrumentalities

would exert to attain or avoid the first-level outcome. Theoretically, one should be able to predict Decision B by multiplying Decision A by the associated expectancy.

Tests with Three Levels of Expectancy. The first step in testing the force model was to calculate two squared correlations for each subject. The first was between Decision A (DA) and Decision B (DB), and the second was between the product of Decision A and the associated expectancy (EDA) and Decision B. Table VI shows that for four of the job-related exercises, DA was a significantly ($p < 0.05$) better predictor of DB than was EDA. In the other job-related exercise, the difference was not statistically significant. In the student effort exercise, the EDA was a significantly better predictor of DB than was DA alone.

The next step in testing the force model was to calculate another squared correlation. This squared correlation was between the product of Decision A and the associated "binary" expectancy (BDA) and DB. As was indicated in Chapter I, a binary expectancy can have only one of two values, either zero or one. Thus, in calculating BDA, the 0.4 and 0.8 values of the given expectancies were changed to 1; the zero values were unchanged. Table VII shows the results of the comparisons between the mean squared correlations between DA and DB, and the mean squared correlations between BDA and DB. This time four statistically significant results emerged, and again the job-related tests differed from the student effort test. Obviously, the results of the first two sets of tests are

TABLE VI

Tests of Explained Variation in the Force Model - Continuous Expectancy versus First-Level Valence

Instrument	Variables	Mean Squared Correlation Coefficient	t-Value	df	Two-Tailed p
JC-H̄	DA, DB	0.786	4.42	17	0.000
	EDA, DB	0.621			
JS-H̄	DA, DB	0.784	6.72	17	0.000
	EDA, DB	0.548			
JC-H	DA, DB	0.750	2.49	30	0.018
	EDA, DB	0.626			
JS-H	DA, DB	0.676	1.59	15	0.133
	EDA, DB	0.581			
JC	DA, DB	0.771	3.22	15	0.006
	EDA, DB	0.615			
SE	DA, DB	0.293	4.80	14	0.000
	EDA, DB	0.629			

TABLE VII

Tests of Explained Variation in the Force Model - Binary Expectancy versus First-Level Valence

Instrument Variable		Mean Squared Correlation Coefficient	t-Value	df	Two-Tailed p
JC-$\bar{H}$	DA, DB	0.786	2.50	17	0.023
	BDA, DB	0.683			
JS-$\bar{H}$	DA, DB	0.784	4.84	17	0.000
	BDA, DB	0.606			
JC-H	DA, DB	0.750	1.25	30	0.220
	BDA, DB	0.685			
JS-H	DA, DB	0.676	0.45	15	0.656
	BDA, DB	0.648			
JC	DA, DB	0.771	2.29	15	0.037
	BDA, DB	0.662			
SE	DA, DB	0.293	4.11	14	0.001
	BDA, DB	0.582			

less than conclusive.

A third set of tests was then performed, this time between the mean squared correlation of EDA and DB, and the mean squared correlation of BDA and DB. As Table VIII shows, converting a continuous expectancy to a binary expectancy significantly increases the predictive power of the force model in the job-related exercises. The tests revealed no statistically significant difference between the two types of expectancy in the student effort model.

From these three sets of tests on the job-related data one might conclude that a first-level valence (DA) is the best predictor of force (DB), that the product of the first-level valence and the associated binary expectancy (BDA) is the next best predictor of force, and that the product of the first-level valence and the associated continuous expectancy (EDA) is the least accurate predictor of force. For the student effort data, however, EDA and BDA were both better predictors of DB than was DA. There was no statistically significant difference between EDA and BDA.

Tests with One Level of Expectancy Excluded. In addition to these three types of tests, another form of analysis, first performed by Morehouse (1979), was accomplished. This analysis also involved calculating 1) the mean squared correlation between DA and DB, and 2) the mean squared correlation between EDA and DB. However, each time those calculations were made, the decisions associated with one level of expectancy were excluded. A paired-sample t-test was then performed between

TABLE VIII

Tests of Explained Variation in the Force Model - Continuous Expectancy Versus Binary Expectancy

Instrument	Variables	Mean Squared Correlation Coefficient	t-Value	df	Two-Tailed p
JC-$\overline{H}$	EDA, DB	0.621	8.28	17	0.000
	BDA, DB	0.683			
JS-$\overline{H}$	EDA, DB	0.548	11.92	17	0.000
	BDA, DB	0.606			
JC-H	EDA, DB	0.626	7.37	30	0.000
	BDA, DB	0.685			
JS-H	EDA, DB	0.581	9.93	15	0.000
	BDA, DB	0.648			
JC	EDA, DB	0.615	6.23	15	0.000
	BDA, DB	0.662			
SE	EDA, DB	0.629	1.25	14	0.233
	BDA, DB	0.582			

each of the three sets of mean squared correlations for each of the six sets of data. Thus, 18 paired-sample t-tests were performed; the results are shown in Table IX.

Morehouse (1979) hypothesized that if DA were not a good predictor of DB where expectancy was not equal to zero, and if DA were a good predictor of DB where expectancy was equal to 0.4 or 0.8, expectancy could be thought of as a binary variable or, as he called it, a "dichotomous" variable. Indeed, the results of this type of analysis, when applied to the student effort exercise, tend to confirm Morehouse's findings--expectancy is a binary variable.

The same analysis, when applied to the job-related exercises, does not support the concept of expectancy as a binary variable. In those cases DA was a better predictor of DB than was EDA calculated with one of the three levels of expectancy omitted. In 11 of the 15 job-related t-tests, the difference was statistically significant.

Locus of Control

It was hypothesized that a subject with an external locus of control would have a higher percentage of Decisions B equal to zero when the associated expectancy was equal to zero than would a subject with an internal locus of control. If that were true, there should be a significant correlation between the locus of control variable and the corresponding "percent zero" variable. Table X shows those correlations.

Only one of those correlations is statistically significant,

TABLE IX

Tests of Explained Variation in the Force Model - One Level of Expectancy Excluded

Instrument	Variables	Mean Squared Correlation Coefficient	t-Value	df	Two-Tailed p
JC-$\bar{H}$ $E \neq 0$	DA, DB	0.883	9.78	17	0.000
	EDA, DB	0.799			
JC-$\bar{H}$ $E \neq 0.4$	DA, DB	0.729	2.79	17	0.013
	EDA, DB	0.567			
JC-$\bar{H}$ $E \neq 0.8$	DA, DB	0.760	2.96	17	0.009
	EDA, DB	0.568			
JS-$\bar{H}$ $E \neq 0$	DA, DB	0.849	11.80	17	0.000
	EDA, DB	0.762			
JS-$\bar{H}$ $E \neq 0.4$	DA, DB	0.741	4.71	17	0.000
	EDA, DB	0.500			
JS-$\bar{H}$ $E \neq 0.8$	DA, DB	0.795	5.72	17	0.000
	EDA, DB	0.503			
JC-H $E \neq 0$	DA, DB	0.856	7.36	30	0.000
	EDA, DB	0.776			
JC-H $E \neq 0.4$	DA, DB	0.658	0.88	30	0.383
	EDA, DB	0.604			
JC-H $E \neq 0.8$	DA, DB	0.671	1.10	30	0.280
	EDA, DB	0.597			

Table IX (continued)

Instrument	Variables	Mean Squared Correlation Coefficient	t-Value	df	Two-Tailed p
JS-H E ≠ 0	DA, DB	0.812	11.41	15	0.000
	EDA, DB	0.722			
JS-H E≠0.4	DA, DB	0.603	0.71	15	0.489
	EDA, DB	0.541			
JS-H E≠0.8	DA, DB	0.643	0.38	15	0.709
	EDA, DB	0.605			
JC E ≠ 0	DA, DB	0.854	5.63	15	0.000
	EDA, DB	0.790			
JC E≠0.4	DA, DB	0.727	2.20	15	0.044
	EDA, DB	0.571			
JC E≠0.8	DA, DB	0.752	2.84	15	0.012
	EDA, DB	0.544			
SE E≠0	DA, DB	0.499	1.10	14	0.289
	EDA, DB	0.566			
SE E≠0.4	DA, DB	0.257	5.28	14	0.000
	EDA, DB	0.712			
SE E≠0.8	DA, DB	0.326	2.58	12	0.024
	EDA, DB	0.597			

TABLE X

Correlations Between Locus of Control and Percentage of Decisions B Equal to Zero Where Expectancy Equals Zero

Instrument	JC-$\bar{H}$	JS-$\bar{H}$	JC-H	JS-H
Correlation	0.177	0.584*	0.062	-0.150

*one-tailed $p < 0.01$

and in the context of the other correlations, this investigator is inclined to dismiss that correlation as spurious. Thus, the limited analysis done in this study did not support the hypothesis that a relationship exists between an individual's locus of control and the amount of force that individual exerts.

IV. SUMMARY AND CONCLUSION

Summary

The focus of this thesis is expectancy theory, which Victor H. Vroom first presented in 1964 in his book, Work and Motivation. Vroom described two models--the valence model and the force model. The valence model described why a person finds certain outcomes attractive or unattractive. The force model described how much effort a person will exert to attain or avoid an outcome.

Both of the models had been tested, but results were mixed. Some researchers concluded that the models had theoretical shortcomings, which they tried to correct by expanding and refining the models. When the new models also received only mixed support, it was suggested that the test methodologies were incorrect--not the models. Therefore, the original models should be retested.

One suggestion was to test the valence model through the use of policy capturing, a mathematical technique of modeling human decision-making (Mitchell and Beach, 1977). Another suggestion was that the lack of support for the force model might be the result of a binary (0 or 1), rather than continuous nature in expectancy (Morehouse, 1979). A third suggestion was that an individual's locus of control might affect the amount of force an individual will exert (Mitchell,

1979). The purpose of this thesis, then, was to test the original valence and force models with these suggestions in mind.

One hundred fifteen Air Force Institute of Technology graduate students participated in the study. Three types of instruments were used to collect data from five different groups. Each group received instruments related to either job choice or job satisfaction; one group also received a student effort instrument. Each instrument required a subject to make 24 pairs of decisions. The first decision indicated the attractiveness, or valence, of a first-level outcome. The second decision indicated how much force the subject would exert to attain or avoid that outcome. The first- and second-level outcomes, the instrumentalities, and the expectancies for each pair of decisions were stated (not measured) values. The data from the instruments were examined through frequency analysis, regression analysis, correlation analysis, and paired-sample t-tests.

The subjects were internally consistent in completing the instruments. The lowest average adjusted R^2 for any one of the six groups of data was 0.686; the next lowest was 0.828. The lowest adjusted R^2 for an individual was 0.392; the next lowest was 0.549. Thus, the instruments are reliable.

There was strong support for the valence model. In each of the six groups of data a sum of beta-weighted instrumentalities had significantly more predictive power than did a sum of equally-weighted instrumentalities. Knowledge of second-level

valences does increase one's ability to predict first-level valence.

Tests of the force model did not support the multiplicative calculations the model requires. In the job-related exercises, first-level valence was the most accurate predictor of force; the product of the first-level valence and a binary expectancy was the next best predictor; the product of the first-level valence and continuous expectancy was the least accurate predictor. The student effort exercises had different results--expectancy did seem to have a binary nature.

In reviewing all 36 of the tests of explained variation in the force model, it is clear that student effort decisions differ from job-related decisions. There are at least two possible reasons for the difference. First of all, job-related decisions tend to depend upon information from outside sources --the Military Personnel Center (MPC), for example. If MPC "officially" indicates that an officer will not be able to get, avoid, leave, or stay in a particular job, the officer might believe that the desired outcome can be attained through "unofficial" channels. Student effort decisions, on the other hand, tend to be based upon personal observation or upon easily verified information from professors or other students. Thus, the source of information may alter an officer's perception of being able to attain or avoid an outcome.

Secondly, the scales for Decision A are not necessarily comparable across instruments. For example, a job that has a rating of +5 on a job-related attractiveness scale could

reasonably be expected to have a higher actual valence than receiving an A in a course even though receiving an A is rated +5 on the student effort attractiveness scale. An individual might perform an "effort-benefit" analysis and conclude that even though there is very little chance of attaining a job-related outcome, the possible benefits of attaining the outcome justify expending great effort. The ratio of effort required to get an A in a course to benefit derived from getting the A in the course would seem to be much higher than a job-related effort-benefit ratio. Whatever may be the reasons for the differences in results between the student effort and the job-related exercises, they were not further investigated in this study.

Conclusion

Expectancy theory, as a whole, remains unproven. The valence model has received strong and consistent support in this study. The force model received only weak and inconsistent support. In this study, job-related effort decisions were obviously different from student effort decisions. The differences may lie in the sources of information used to make the decisions; perhaps the differences lie in how some type of effort-benefit ratio is perceived.

Just as policy capturing has made possible accurate testing of the valence model, perhaps some new, as yet unknown, test of the force model is required. The force model cannot yet be discarded--its intuitive appeal is too great and there is nothing better to take its place.

reasonably be expected to have a higher actual valence than receiving an A in a course even though receiving an A is rated +5 on the student effort attractiveness scale. An individual might perform an "effort-benefit" analysis and conclude that even though there is very little chance of attaining a job-related outcome, the possible benefits of attaining the outcome justify expending great effort. The ratio of effort required to get an A in a course to benefit derived from getting the A in the course would seem to be much higher than a job-related effort-benefit ratio. Whatever may be the reasons for the differences in results between the student effort and the job-related exercises, they were not further investigated in this study.

Conclusion

Expectancy theory, as a whole, remains unproven. The valence model has received strong and consistent support in this study. The force model received only weak and inconsistent support. In this study, job-related effort decisions were obviously different from student effort decisions. The differences may lie in the sources of information used to make the decisions; perhaps the differences lie in how some type of effort-benefit ratio is perceived.

Just as policy capturing has made possible accurate testing of the valence model, perhaps some new, as yet unknown, test of the force model is required. The force model cannot yet be discarded--its intuitive appeal is too great and there is nothing better to take its place.

BIBLIOGRAPHY

Alderfer, C.P. Existence, Relatedness, and Growth: Human Needs in Organizational Settings. New York: Free Press, 1972.

Cherlin, A. and L.B. Bourque. "Dimensionality and Reliability of the Rotter I-E Scale," Sociometry, 1974, 37(4), 565-582.

DeLeo, P.J. and R.D. Pritchard. "An Examination of Some Methodological Problems in Testing Expectancy-Valence Models with Survey Techniques," Organizational Behavior and Human Performance, 1974, 12, 143-148.

Eran, M. and D. Jacobson. "Expectancy Theory Prediction of the Preference to Remain Employed or to Retire," Journal of Gerontology, 1976, 31(5), 605-610.

Freiberger, W.F. (Ed.). International Dictionary of Applied Mathematics. Princeton: D. Van Nostrand Company, Inc., 1960.

Hammond, K.R., J. Rohrbaugh, J. Mumpower, and L. Adelman. "Social Judgment Theory: Applications of Policy Formation," Human Judgment and Decision Processes in Applied Settings, edited by M.F. Kaplan and S. Schwartz. New York: Academic Press, 1977.

Hamner, W.C. and D.W. Organ. Organizational Behavior: An Applied Psychological Approach. Dallas: Business Publications, Inc., 1978.

Herzberg, F., B. Mauser and B. Snyderman. The Motivation to Work. New York: John Wiley & Sons, Inc., 1959.

Hoffman, P.J. "The Paramorphic Representation of Clinical Judgment," Psychological Bulletin, 1960, 57(2), 116-132.

House, R.J., H.J. Shapiro and M.A. Wahba. "Expectancy Theory as a Predictor of Work Behavior and Attitude: A Reevaluation of Empirical Evidence," Decision Sciences, 1974, 5, 481-506.

Ivancevich, J.M., A.D. Szilagyi and M.J. Wallace. Organizational Behavior and Performance. Santa Monica: Goodyear Publishing Co., Inc., 1977.

Kaplan, M.F. and S. Schwartz (Eds.). Human Judgment and Decision Processes. New York: Academic Press, 1975.

Lawler, E.E., III and J.L. Stuttle. "Expectancy Theory and Job Behavior," Organizational Behavior and Human Performance, 1973, 9, 482-503.

Lied, T.R. and R.D. Pritchard. "Relationships Between Personality Variables and Components of the Expectancy-Valence Model," Journal of Applied Psychology, 1976, 61, 463-467.

Locke, E.A. "Toward a Theory of Task Motivation and Incentives," Organizational Behavior and Human Performance, 1968, 3, 157-189.

Maslow, A.H. Motivation and Personality. New York: Harper and Row, 1954.

Matsui, T. and H. Ikeda. "Effectiveness of Self-Generated Outcomes for Improving Prediction in Expectancy Theory Research," Organizational Behavior and Human Performance, 1976, 17, 289-298.

Mitchell, T.R. "Expectancy Models of Satisfaction, Occupational Preference and Effort: A Theoretical, Methodological and Empirical Appraisal," Psychological Bulletin, 1974, 81, 1053-1077.

Mitchell, T.R. "Organizational Behavior," Annual Review of Psychology, 1979, 30, 243-281.

Mitchell, T.R. and L.R. Beach. "Expectancy Theory, Decision Theory, and Occupational Preference and Choice," Human Judgment and Decision Processes in Applied Settings, edited by M.F. Kaplan and S. Schwartz. New York: Academic Press, 1977.

Mitchell, T.R., C.M. Smyser and S.E. Weed. "Locus of Control: Supervision and Work Satisfaction," Academy of Management Journal, 1975, 18, 623-631.

Morehouse, M.A. "Expectancy Theory and Policy Capturing: A Predictive Model of Student Effort in an Academic Environment." Unpublished master's thesis. Air Force Institute of Technology, Wright-Patterson Air Force Base, OH, September 1979.

Muchinsky, P.M. "A Comparison of Within- and Across-Subject Analysis of the Expectancy-Valence Model for Predicting Effort," Academy of Management Journal, 1977 20(1), 154-158.

Nie, N.H., C.H. Hull, J.G. Jenkins, K. Steinbrenner, and D.H. Bent. Statistical Package for the Social Sciences. New York: McGraw-Hill Book Co., 1975.

Reinharth, L. and M.A. Wahba. "A Test of Alternative Models of Expectancy Theory," Human Relations, 1976, 29(3), 257-272.

Rotter, J.B. "Generalized Expectancies for Internal Versus External Control of Reinforcements," Psychological Monographs, 1966, 80(1), (whole no. 609).

Schmidt, F.L. "Implications of a Measurement Problem for Expectancy Theory Research," Organizational Behavior and Human Performance, 1973, 10, 243-251.

Sims, H.P., A.D. Szilagyi, and D.R. McKemey. "Antecedents of Work Related Expectancies," Academy of Management Journal, 1976, 19(4), 546-559.

Skinner, B.F. The Behavior of Organisms. New York: Appleton-Century-Crofts, 1938.

Slovic, P., B. Fischoff, and S. Lichtenstein. "Behavioral Decision Theory," Annual Review of Psychology, 1977, 28, 1-39.

Slovic, P. and S. Lichtenstein. "Comparison of Bayesian and Regression Approaches to the Study of Information Processing in Judgment," Organizational Behavior and Human Performance, 1971, 6, 649-744.

Stahl, M.J. "Locus of Control, Publication Rate and Job Satisfaction for Scientists and Engineers." Unpublished paper. Wright-Patterson AFB, OH: Air Force Institute of Technology, 1979.

Stahl, M.J. and A.M. Harrell. "Expectancy Theory and Behavioral Decision Theory: Prediction of Job Preference and Job Choice." Unpublished paper. Wright-Patterson AFB, OH: Air Force Institute of Technology, 1979.

Vroom, V.H. Work and Motivation. New York: John Wiley & Sons, Inc., 1964.

Ward, J.H., Jr. "Comments on 'The Paramorphic Representation of Clinical Judgment,'" Psychological Bulletin, 1962, 59(1), 74-76.

APPENDIX A

JOB CHOICE EXERCISE

A DECISION-MAKING EXERCISE FOR AF OFFICERS

This decision-making exercise is designed to investigate how individuals make job-related decisions. Your cooperation in this research will be both sincerely appreciated and strictly confidential.

The exercise contains three sections. Section I simply involves general information about yourself; Section II requires you to make several job-related decisions; Section III asks you to decide which statement in each of several pairs of statements is more accurate. From this information, several hypotheses concerning how individuals make job-related decisions will be statistically tested. The results will be incorporated in a master's thesis at the Air Force Institute of Technology.

If you want to know how your decisions compare with those of your contemporaries, a summary comparison will be mailed to you upon completion of the research. To receive this information, please print your name and address in the space provided at the end of the exercise.

THANK YOU FOR YOUR PARTICIPATION

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. 80-12, Secretary of the Air Force, Powers and Duties, Delegation By.

b. Principal purposes. The decision making exercise 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 decision making data will be converted to information for research use toward management related problems. Results of the research, based on the data provided, will be included in a written master's thesis and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the decision making exercise data, whether in written form or orally presented, will be unlimited.

d. Participation in this decision making exercise 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 exercise.

SECTION I

General Information

Please circle the most correct response or fill in the blank.

1. What is your current rank?

   A. 2nd Lt
   B. 1st Lt
   C. Capt
   D. Major
   E. Lt Col

2. What is your time in grade? _____ years

3. What is your time in service? _____ years

4. What was the Duty Air Force Specialty Code (DAFSC) for your last job? _____

5. In what discipline did you earn your undergraduate degree?

   A. Arts
   B. Business/Accounting
   C. Engineering
   D. Management
   E. Sciences
   F. Other _____

6. In what discipline are you earning your master's degree?

   A. Aero Eng
   B. Astro Eng
   C. Civil Eng
   D. Computer Systems
   E. Electrical Eng
   F. Eng Physics
   G. Logistics
   H. Nuclear Eng
   I. Ops Research
   J. Systems Eng
   K. Systems Management
   L. Other _____

7. What is your age? _____ years

8. What is your sex?

   A. Male B. Female

9. What is your marital status?

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

10. Indicate the ages of your children, if any.

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____

SECTION II

Decision-Making Exercise

This section contains a decision-making exercise. During the exercise you should assume that you have been notified that you will soon be reassigned. A number of jobs are available to you. These jobs do not differ from each other in any respect, except for the factors that are described to you in each instance. In each case, you are asked to make two decisions. First (Decision A), you should judge the attractiveness of the job, based upon the outcomes associated with the four key factors presented to you. Second (Decision B), you should decide how much effort you would exert in relation to avoiding or getting the job, based upon all of the information provided to you about the job.

Work briskly, but do not hurry. There are no "correct" or "incorrect" decisions for these cases, so express your true feelings and intentions. You should attempt to finish the complete exercise in a single sitting, which should take about 15 minutes. Thank you for your cooperation in participating in this study.

JOB #1

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #2

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . .VERY NEGATIVE

--being promoted to the next higher rank is . . . . . .VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #3

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #4

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #5

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #6

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #7

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #8

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #9

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #10

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #11

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #12

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #13

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #14

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #15

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #16

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #17

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #18

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #19

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #20

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to avoid it										Great effort to get it

JOB #21

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . .VERY NEGATIVE

--being promoted to the next higher rank is . . . . . .VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #22

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . .VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . .VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . .VERY POSITIVE

--being promoted to the next higher rank is . . . . . .VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #23

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

JOB #24

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to avoid this job or to get this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to avoiding or getting this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to avoid it — Great effort to get it

SECTION III

The questions in this final part of the survey are intended to find out the way in which certain important events in our society affect different people. Each item consists of a pair of items lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one which you would like to be true. This is a measure of personal belief, so obviously, there are no right or wrong answers. In some instances you may find that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. Respond to each question independently of how you answered any other question. Again, answer by circling the letter corresponding to the answer you more strongly believe to be the case as far as you are concerned.

1. a) Many of the unhappy things in people's lives are partly due to bad luck.
   b) People's misfortunes result from mistakes they make.

2. a) In the long run people get the respect they deserve in this world.
   b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

3. a) Without the right breaks, one cannot be an effective leader.
   b) Capable people who fail to become leaders have not taken advantage of their opportunities.

4. a) No matter how hard you try, some people just don't like you.
   b) People who can't get others to like them don't understand how to get along with others.

5. a) I have often found that what is going to happen will happen.
   b) Trusting to fate has never turned out as well for me as making a decision to take a definite course.

6. a) Becoming a success is a matter of hard work, luck has little or nothing to do with it.
   b) Getting a good job depends mainly on being in the right place at the right time.

7. a) When I make plans I am almost certain that I can make them work.
   b) It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

8. a) In my case, getting what I want has little or nothing to do with luck.

   b) Many times we might as well decide what to do by flipping a coin.

9. a) Who gets to be the boss often depends on who was lucky enough to be in the right place first.

   b) Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.

10. a) Most people do not realize the extent to which their lives are controlled by accidental happenings.

    b) There is really no such thing as "luck."

11. a) It is hard to know whether or not a person really likes you.

    b) How many friends you have depends upon how nice a person you are.

12. a) In the long run, the bad things that happen to us are balanced by the good ones.

    b) Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

13. a) Many times I feel that I have little influence over the things that happen to me.

    b) It is impossible for me to believe that chance or luck plays an important role in my life.

14. a) People are lonely because they don't try to be friendly.

    b) There is not much use in trying too hard to please people; if they like you, they like you.

15. a) What happens to me is my own doing.

    b) Sometimes I feel I don't have enough control over the direction my life is taking.

APPENDIX B

JOB SATISFACTION EXERCISE

A DECISION-MAKING EXERCISE FOR AF OFFICERS

This decision-making exercise is designed to investigate how individuals make job-related decisions. Your cooperation in this research will be both sincerely appreciated and strictly confidential.

The exercise contains three sections. Section I simply involves general information about yourself; Section II requires you to make several job-related decisions; Section III asks you to decide which statement in each of several pairs of statements is more accurate. From this information, several hypotheses concerning how individuals make job-related decisions will be statistically tested. The results will be incorporated in a master's thesis at the Air Force Institute of Technology.

If you want to know how your decisions compare with those of your contemporaries, a summary comparison will be mailed to you upon completion of the research. To receive this information, please print your name and address in the space provided at the end of the exercise.

THANK YOU FOR YOUR PARTICIPATION

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. 80-12, Secretary of the Air Force, Powers and Duties, Delegation By.

b. Principal purposes. The decision making exercise 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 decision making data will be converted to information for research use toward management related problems. Results of the research, based on the data provided, will be included in a written master's thesis and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the decision making exercise data, whether in written form or orally presented, will be unlimited.

d. Participation in this decision making exercise 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 exercise.

SECTION I

General Information

Please circle the most correct response or fill in the blank.

1. What is your current rank?

   A. 2nd Lt
   B. 1st Lt
   C. Capt
   D. Major
   E. Lt Col

2. What is your time in grade? _____ years

3. What is your time in service? _____ years

4. What was the Duty Air Force Specialty Code (DAFSC) for your last job? _____

5. In what discipline did you earn your undergraduate degree?

   A. Arts
   B. Business/Accounting
   C. Engineering
   D. Management
   E. Sciences
   F. Other _____

6. In what discipline are you earning your master's degree?

   A. Aero Eng
   B. Astro Eng
   C. Civil Eng
   D. Computer Systems
   E. Electrical Eng
   F. Eng Physics
   G. Logistics
   H. Nuclear Eng
   I. Ops Research
   J. Systems Eng
   K. Systems Management
   L. Other _____

7. What is your age? _____ years

8. What is your sex?

   A. Male B. Female

9. What is your marital status?

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

10. Indicate the ages of your children, if any.

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____

SECTION II

Decision-Making Exercise

This section contains a decision-making exercise. During the exercise, you should assume that you have been notified that you might be reassigned. A number of jobs are available to you, as is the option of remaining in your current job. Assume that the job descriptions in this exercise refer to the job you currently hold. The jobs described do not differ from each other in any respect, except for the factors that are described to you in each instance. In each case, you are asked to make two decisions. First (Decision A), you should judge the attractiveness of the job, based upon the outcomes associated with the four key factors presented to you. Second (Decision B), you should decide how much effort you would exert in relation to leaving or remaining in your current job, based upon all of the information provided to you about the job.

Work briskly, but do not hurry. There are no "correct" or "incorrect" decisions for these cases, so express your true feelings and intentions. You should attempt to finish the complete exercise in a single sitting, which should take about 15 minutes. Thank you for your cooperation in participating in this study.

JOB #1

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #2

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #3

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #4

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #5

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #6

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #7

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #8

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #9

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #10

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #11

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #12

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #13

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #14

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #15

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #16

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #17

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #18

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

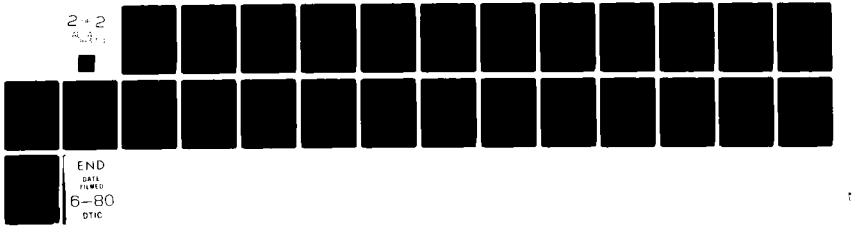
-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

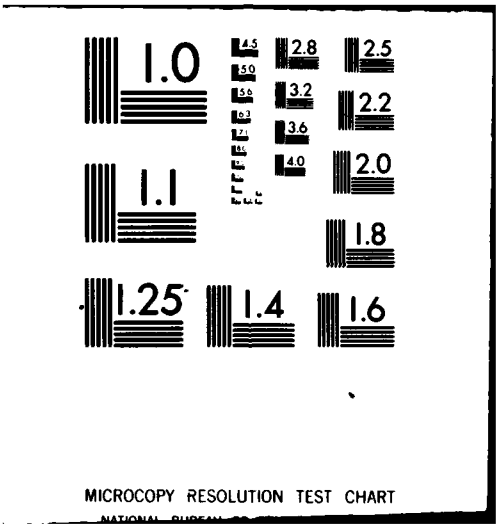
DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort remain in it

AD-A083 714 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOO--ETC F/G 5/10
A POLICY-CAPTURING INVESTIGATION OF EXPECTANCY THEORY MODELS OF--ETC(U)
DEC 79 N C WAGNER
UNCLASSIFIED AFIT/GSM/SM/79D-21 NL



END
DATE FILMED
6-80
DTIC


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART

JOB #19

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE
--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE
--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE
--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #20

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE
--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE
--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE
--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB # 21

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE

--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is HIGH (probability = 80%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

---

JOB #22

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE

--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE

--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE

--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Great effort to leave it										Great effort to remain in it

JOB #23

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY NEGATIVE
--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY POSITIVE
--the utilization of your special skills and knowledge is . . . . . VERY POSITIVE
--being promoted to the next higher rank is . . . . . VERY NEGATIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is ZERO (probability = 0%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

JOB #24

The four factors and outcomes shown below are associated with this job in the ways described.

The relationship between this job and--

--your assignment to a favorable geographic location is . . . . . VERY POSITIVE
--the work conditions your family wants you to have (TDY, stress, overtime, etc.) is. . . VERY NEGATIVE
--the utilization of your special skills and knowledge is . . . . . VERY NEGATIVE
--being promoted to the next higher rank is . . . . . VERY POSITIVE

DECISION A. With the factors and outcomes shown above in mind, indicate the attractiveness of this job to you.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great effort either to leave this job or to remain in this job, the likelihood that you will be successful is MODERATE (probability = 40%)

DECISION B. With the attractiveness and likelihood information above in mind, indicate the level of effort you would exert in relation to leaving or remaining in this job.

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Great effort to leave it — Great effort to remain in it

SECTION III

The questions in this final part of the survey are intended to find out the way in which certain important events in our society affect different people. Each item consists of a pair of items lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one which you would like to be true. This is a measure of personal belief, so obviously, there are no right or wrong answers. In some instances you may find that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. Respond to each question independently of how you answered any other question. Again, answer by circling the letter corresponding to the answer you more strongly believe to be the case as far as you are concerned.

1. a) Many of the unhappy things in people's lives are partly due to bad luck.
   b) People's misfortunes result from mistakes they make.

2. a) In the long run people get the respect they deserve in this world.
   b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

3. a) Without the right breaks, one cannot be an effective leader.
   b) Capable people who fail to become leaders have not taken advantage of their opportunities.

4. a) No matter how hard you try, some people just don't like you.
   b) People who can't get others to like them don't understand how to get along with others.

5. a) I have often found that what is going to happen will happen.
   b) Trusting to fate has never turned out as well for me as making a decision to take a definite course.

6. a) Becoming a success is a matter of hard work, luck has little or nothing to do with it.
   b) Getting a good job depends mainly on being in the right place at the right time.

7. a) When I make plans I am almost certain that I can make them work.
   b) It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

8. a) In my case, getting what I want has little or nothing to do with luck.

   b) Many times we might as well decide what to do by flipping a coin.

9. a) Who gets to be the boss often depends on who was lucky enough to be in the right place first.

   b) Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.

10. a) Most people do not realize the extent to which their lives are controlled by accidental happenings.

    b) There is really no such thing as "luck."

11. a) It is hard to know whether or not a person really likes you.

    b) How many friends you have depends upon how nice a person you are.

12. a) In the long run, the bad things that happen to us are balanced by the good ones.

    b) Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

13. a) Many times I feel that I have little influence over the things that happen to me.

    b) It is impossible for me to believe that chance or luck plays an important role in my life.

14. a) People are lonely because they don't try to be friendly.

    b) There is not much use in trying too hard to please people; if they like you, they like you.

15. a) What happens to me is my own doing.

    b) Sometimes I feel I don't have enough control over the direction my life is taking.

APPENDIX C

STUDENT EFFORT EXERCISE

SECTION III

Exercise Description

The exercise consists of a number of hypothetical courses, with three outcomes associated with receiving an A in each course. The relationship between an A in the course and each of the factors can assume one of two values, VERY POSITIVE or ZERO. Below is a sample course using all of the factors. An explanation of the two ZERO relationships is provided -- special note should be taken of these explanations, for they do not appear in the format of the remaining courses.

SAMPLE COURSE

The relationship between an A in this course and ...

... an improved GPA (so much effort is required for this course you may receive lower grades in other courses) is .. ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction (an A in this course is not a reflection of accomplishment) is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
No additional effort to get an A										Great additiona effort to get an A

**NOTE: When making Decision B, you should assume that your present level of effort will earn you a "B" in the course.

Notice that for each course, you are asked to make two decisions. First (Decision A), you should judge the attractiveness of an A in the course, based upon the outcomes associated with the three key factors presented to you. Second (Decision B), you should decide how much additional effort you would exert in relation to the course, based upon all of the information provided to you.

Decision Making Exercise

The remainder of this section contains a decision making exercise. During the exercise, you should assume that you are presently enrolled in a number of academic courses. These courses do not differ from each other, except for the factors that are described to you in each instance. However, each course is different from all the others because of the information it contains. For this reason, please examine and consider each course carefully, and make your decisions based upon the information it contains.

Work briskly, but do not hurry. There are no "correct" or "incorrect" decisions for these courses, so express your true feelings and intentions. You should attempt to finish the complete exercise in a single sitting, which should take about 20 minutes.

Thank you for your cooperation in participating in this study.

2

Notice that for each course, you are asked to make two decisions. First (Decision A), you should judge the attractiveness of an A in the course, based upon the outcomes associated with the three key factors presented to you. Second (Decision B), you should decide how much additional effort you would exert in relation to the course, based upon all of the information provided to you.

Decision Making Exercise

The remainder of this section contains a decision making exercise. During the exercise, you should assume that you are presently enrolled in a number of academic courses. These courses do not differ from each other, except for the factors that are described to you in each instance. However, each course is different from all the others because of the information it contains. For this reason, please examine and consider each course carefully, and make your decisions based upon the information it contains.

Work briskly, but do not hurry. There are no "correct" or "incorrect" decisions for these courses, so express your true feelings and intentions. You should attempt to finish the complete exercise in a single sitting, which should take about 20 minutes.

Thank you for your cooperation in participating in this study.

2

COURSE # 1

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 2

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 3

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
No additional effort to get an A										Great additional effort to get an A

COURSE # 4

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
No additional effort to get an A										Great additional effort to get an A

COURSE # 5

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 6

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 7

The relationship between an A in this course ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 8

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 9

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 10

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

7

COURSE # 11

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 12

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 13

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great Additional effort to get an A

COURSE # 14

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 15

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 16

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

10

COURSE # 17

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
No additional effort to get an A										Great additiona effort to get an A

COURSE # 18

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Very Unattractive										Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
No additional effort to get an A										Great additiona effort to get an A

COURSE # 19

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 20

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 21

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive ... Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is moderate (probability = 40%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A ... Great additional effort to get an A

COURSE # 22

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive ... Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A ... Great additional effort to get an A

COURSE # 23

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... VERY POSITIVE

... the regard of your classmates is ..... VERY POSITIVE

... a feeling of personal satisfaction is ..... VERY POSITIVE

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is high (probability = 80%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

COURSE # 24

The relationship between an A in this course and ...

... an improved Grade Point Average is ..... ZERO

... the regard of your classmates is ..... ZERO

... a feeling of personal satisfaction is ..... ZERO

Decision A. With the factors and outcomes shown above in mind, indicate the attractiveness of an A in this course:

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

Very Unattractive — Very Attractive

Further Information. If you exert a great amount of additional effort, the likelihood you can get an A is zero (probability = 0%).

Decision B. With the attractiveness and likelihood information above in mind, indicate how much additional effort you would exert in this course to get an A.

0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

No additional effort to get an A — Great additional effort to get an A

APPENDIX D

FORTRAN REGRESSION PROGRAM

```
      C   POLICY CAPTURING ANALYSIS
      C   THIS PROGRAM IS FOR USE WITH AN ORTHOGONAL PREDICTOR MATRIX ONLY.

      C   DEFINITIONS:
      C     CASE          = INDIVIDUAL CASE ID NUMBER
      C     ND            = # OF DECISIONS
      C     NF            = # OF FACTORS (CUES)
      C     X             = PREDICTOR MATRIX
      C     Y             = CRITERION MATRIX
      C     XPX           = X'X MATRIX
      C     XPXINV        = VALUE OF A DIAGONAL ELEMENT OF THE (X'X)**-1 MATRIX
      C     YBAR          = MEAN VALUE OF Y
      C     SIGX          = STANDARD DEVIATION OF ONE FACTOR (CUE)
      C     SIGY          = STANDARD DEVIATION OF Y
      C     RSQ           = SSE/SST, THE COEFFICIENT OF DETERMINATION
      C                     RSQ IS EQUAL TO THE SUM OF THE SQUARED BETA WEIGHTS
      C                     VALID IFF THE X MATRIX IS ORTHOGONAL
      C     BWT(J)        = BETA WEIGHT FOR FACTOR J
      C     RWT(J)        = BWT(J)**2/RSQ, RELATIVE WEIGHT OF FACTOR J
      C                     COMPUTING A RELATIVE WEIGHT IN THIS MANNER IS
      C                     VALID IFF THE X MATRIX IS ORTHOGONAL
      C     B = ((X'X)**-1) X' Y

            PROGRAM ORTHO(INPUT,OUTPUT,PUNCH,TAPE1,TAPE2)

            INTEGER CASE,ERROR,ND,NF,SUM
            REAL REALND,RSQ,SIGX,SIGY,XPXINV,YBAR
            INTEGER Y(32),X(32,6),XPX(32,6)
            REAL BWT(6),RWT(6)

            DATA NF,ND/4,24/
      C     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
      C     * CAUTION: DO NOT FORGET TO ADJUST FORMAT STATEMENTS 2,4,6,,8,9(RE: NF,ND)
      C     * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
      C   READ THE FACTOR CODING FOR THE PREDICTOR (X) MATRIX.
      C   THERE MUST BE NO CARDS WITH NF LEFT-JUSTIFIED 1'S AND 0'S.
```

```
      PRINT 1
      READ 2, ((X(I,J),J=1,NF),I=1,ND)
      IF (ECF(5LINPUT).NE.0) STOP

C     RECODE THE PREDICTOR MATRIX TO A +1/-1 FORMAT TO YIELD ZERO MEANS.

      DO 20 I=1,ND
         DO 10 J=1,NF
         IF (X(I,J).EQ.0)  X(I,J) = -1
   10    CONTINUE
   20 CONTINUE

C     CALCULATE THE X'X MATRIX AS A CHECK ON ORTHOGONAL DESIGN.
C     THE X'X MATRIX SHOULD BE DIAGONAL WITH ND ON THE DIAGONAL.

      ERROR=0
      DO 50 I=1,NF
         DO 40 J=1,NF
         SUM=0
            DO 30 K=1,ND

            SUM=SUM+X(K,I) *X(K,J)
   30       CONTINUE
         XPX(I,J)=SUM
         IF (I.EQ.J .AND. SUM.NE.ND) ERROR = 1
         IF (I.NE.J .AND. SUM.NE.0 ) ERROR = 1
   40    CONTINUE
   50 CONTINUE

C     PRINT THE X'X MATRIX.

      PRINT 3
      PRINT 4, ((XPX(I,J),J=1,NF),I=1,NF)
      IF (ERROR.EQ.1) PRINT 5
      IF (ERROR.EQ.1) STOP
```

```
      REALND=ND
      XPXINV=1/REALND
      SIGX=SQRT(REALND/(REALND-1))

C     START PROCESSING FOR ONE CASE.
C     READ THE CRITERION (Y) MATRIX. THERE SHOULD BE ND VALUES.

  100 READ 6, CASE,(Y(I),I=1,ND)
      IF (EOF(5LINPUT).NE.0) STOP

C     CALCULATE THE MEAN AND VARIANCE OF Y.

      YBAR=0
      SIGY=0
      DO 110 I=1,ND
      YBAR=YBAR+Y(I)
      SIGY=SIGY+Y(I)**2
  110 CONTINUE
      SIGY=SQRT((SIGY-YBAR**2/REALND)/(REALND-1))
      IF (SIGY.EQ.0) PRINT 7,CASE
      IF (SIGY.EQ.0) GO TO 100
      YBAR=YBAR/ND

C     COMPUTE COEFFICIENTS, STANDARDIZE THEM, AND ACCUMULATE R**2.

      RSQ=0
      DO 130 J=1,NF
      BWT(J)=0
         DO 120 I=1,ND
         BWT(J)=BWT(J)+X(I,J)*Y(I)
  120    CONTINUE
      BWT(J)=XPXINV*BWT(J)*SIGX/SIGY
      RSQ=RSQ+BWT(J)**2
  130 CONTINUE
```

```
C   COMPUTE RELATIVE WEIGHTS.

110       DO 140 I=1,NF
          RWT(I)=BWT(I)**2/RSQ
 140   CONTINUE

C   PRINT THE RESULTS.

115
          PRINT 8,CASE,YBAR,(BWT(I),I=1,NF),RSQ,SIGY,(RWT(I),I=1,NF)

          IF (CASE.GE.   0)
         +PUNCH 9,CASE,RSQ,YBAR,SIGY,(BWT(I),I=1,NF)
120
          GO TO 100

  1       FORMAT (1H1)

125       2     FORMAT (4I1)

          3     FORMAT (5X,"THE X'X MATRIX SHOULD BE DIAGONAL ",
                +          "WITH NO ON THE DIAGONAL."/)

130       4     FORMAT (20X,4I6/)

          5     FORMAT (5X,"THERE IS AN ERROR IN THE ORTHOGONAL CODING.")

          6     FORMAT ( 1X,I3,1X,24I2  )
135
          7     FORMAT (" #",I2,"  IS A BAD CASE: SIGY = 0"/)

          8     FORMAT (5X,"CASE # ",I3,"  YBAR = ",F6.3,"  BETA WTS: ",4F10.3/
                +        5X," RSQ = ",F6.3,"  SIGY = ",F6.3,"   REL WTS: ",4F10.3/)
140
          9     FORMAT (1X,I3,"C",T11,3(F6.3,4X),4(F6.3,1X))

        999     STOP
                END
```

VITA

Norbert C. Wagner, Jr. was born in New Kensington, Pennsylvania on 19 November 1949. He entered the United States Air Force Academy in 1967, majored in Computer Science, and graduated in 1971 with a Bachelor of Science degree. He completed Undergraduate Pilot Training at Vance AFB, Oklahoma in June 1972 and was assigned to Forbes AFB, Kansas. He later served as a C-130 pilot and flight instructor at Little Rock AFB, Arkansas. In 1978 he was assigned to the Air Force Institute of Technology, Wright-Patterson AFB, Ohio as a graduate student in Systems Management. He is married to the former Janet Ann Gillespie of Arnold, Pennsylvania.

Permanent Address:

617 Freeport Road
Creighton, Pennsylvania 15030